

CORNELL UNIVERSITY OFFICIAL PUBLICATION

Volume XXII

Number 14

Announcement of the Fortieth

Summer Session

1931

Ithaca, New York
Published by the University
March 1, 1931

ANNOUNCEMENT OF THE SUMMER SESSION

This pamphlet is designed to give prospective students complete information about the Summer Session of Cornell University. On the last page there is a list of other publications which describe the courses of study offered during the regular academic year by the several colleges and schools of the University.

SUMMER SESSION OF THE LAW SCHOOL

See page 54 for information about the summer courses in Law to be given at Cornell University in 1931.

THE SUMMER SCHOOL OF BIOLOGY

See page 55 for information about the summer courses in Biology to be given at Cornell University in 1931.

THE NEW YORK STATE SUMMER SESSION AT CORNELL UNIVERSITY

See page 61 for information about the summer courses in Agriculture and in Home Economics to be given at Cornell University in 1931.

OFFICE AT GOLDWIN SMITH 252

The office of the Summer Session is in Room 252, Goldwin Smith Hall. This office will be open as a bureau of information on registration day from 9 A. M. till 1 P. M. and from 2 till 5 P. M., and thereafter throughout the session, daily except Saturday from 9 till 12:30 and from 2 till 4.

Members of the staff of instruction may be consulted at their offices on Monday, July 6.

THE SESSION MUST BEGIN PROMPTLY

In order to get the full number of exercises announced for the session, it is necessary that all work begin promptly on Tuesday morning, July 7. Students are urged to reach Ithaca in time to be present at the first exercise of each class. They should, if possible, register on Monday, July 6; if not, then on Tuesday, July 7, in an hour not occupied by class work.

THE CALENDAR

SUMMER SESSION OF 1931

THE FIRST TEN DAYS

July 6, Monday, 8 A. M. - 5 P. M.	Registration, <i>Room A, Goldwin Smith Hall.</i>
July 7, Tuesday	Instruction begins at the time and place announced for each course. Registration is continued in <i>Goldwin Smith A.</i>
July 7, Tuesday evening	Organ Recital, <i>Sage Chapel.</i>
July 10, Friday, until 4 P. M.	Last day for payment of fees at the Treasurer's office, <i>Morrill Hall.</i>
July 12, Sunday, 11 A. M.	Public Worship and Sermon in <i>Sage Chapel.</i>
July 12, Sunday evening.	Organ Recital, <i>Bailey Hall.</i>
July 13, Monday evening	Lecture Course.

THE REGULAR WEEKLY SCHEDULE

Sunday, 11 A. M. Public Worship and Sermon, *Sage Chapel.* (Beginning July 12.)
 Sunday evening, Organ Recital, *Bailey Hall.* (Beginning July 12.)
 Monday evening, Lecture Course. (Beginning July 13.)
 Tuesday evening, Organ Recital, *Sage Chapel.* (Beginning July 7.)
 Wednesday evening, Departmental Lectures and Conferences. (Beginning July 8.)
 Friday evening, Plays by Summer Theater Company. (Beginning July 10.)
 Saturday evening, Plays by Summer Theater Company. (Beginning July 11.)

THE LAST DAY

August 14, Friday.....Summer Session ends.

THE WEEKLY CALENDAR

The WEEKLY CALENDAR of the University carries announcements of all public exercises held in connection with the Summer Session. It is posted on the bulletin boards.

CORNELL UNIVERSITY

THE SUMMER SESSION OF 1931

OFFICERS

The President of the University

LIVINGSTON FARRAND, A.B., M.D., L.H.D., LL.D.

ADMINISTRATIVE BOARD

Executive Committee

RIVERDA HARDING JORDAN, Ph.D., *Chairman*

BENTON SULLIVAN MONROE, Ph.D., *Secretary*

FLOYD KARKER RICHTMYER, Ph.D., *Dean of the Graduate School*

DEXTER SIMPSON KIMBALL, M.E., *Dean of the College of Engineering*

ROBERT MORRIS OGDEN, Ph.D., *Dean of the College of Arts and Sciences*

ROLLAND MACLAREN STEWART, Ph.D., *Director, New York State Summer Session*

The Registrar

EUGENE FRANCIS BRADFORD, Ph.D.

The Dean of Women

R. LOUISE FITCH, A.M.

STAFF OF INSTRUCTION

(The names of the instructors in the New York State Summer Session at Cornell University are printed on pages 64-66; those of the instructors in the Summer Session of Law, on page 54; those of the instructors in the Summer School of Biology, on page 55.)

JOSEPH QUINCY ADAMS, Ph.D., Litt.D.	English
(Professor of English)	
VAN METER AMES	Philosophy
(Assistant Professor of Philosophy, University of Cincinnati)	
ALFRED WILLIAM AVENS, M.S.	Chemistry
(Instructor in Chemistry)	
ELIZABETH BAKER, A.B.	Geology
(Instructor in Geology)	
MAURICE OLIVER BAKER, A.B.	Chemistry
(Assistant in Qualitative Analysis)	
DANE LEWIS BALDWIN, M.A.	English
(Instructor in English)	
DOROTHY HAMMOND BATEMAN	Physical Education
(Instructor in Physical Education)	
ERL BATES, M.S., M.D.	Anthropology
(Adviser in Indian Extension)	
CARL BECKER, Ph.D.	History
(Professor of Modern European History)	
JEROME H. BENTLEY, M.A.	Education
(Secretary for Education, New York City Y. M. C. A., and Late Superintendent of Schools, Duluth, Minn., and Richmond, Ind.)	
MADISON BENTLEY, Ph.D.	Psychology
(Sage Professor of Psychology)	
MORRIS GILBERT BISHOP, Ph.D.	French
(Assistant Professor of the Romance Languages and Literatures)	
ALBERT WILHELM BOESCHE, Ph.D.	German
(Professor of German)	
SAMUEL LATIMER BOOTHROYD, M.S.	Astronomy
(Professor of Astronomy)	

JULIAN PLEASANT BRETZ, Ph.D.	History
(Professor of American History)	
THOMAS ROLAND BRIGGS, Ph.D.	Chemistry
(Professor of Physical Chemistry and Electro-Chemistry)	
ALBERT PERLEY BROGAN, Ph.D.	Philosophy
(Professor of Philosophy, University of Texas)	
ARTHUR WESLEY BROWNE, Ph.D.	Chemistry
(Professor of Inorganic and Analytical Chemistry)	
LEROY P. BURNHAM, M.S. in Arch.	Architecture
(Professor of Architecture)	
EARLE NELSON BURROWS, M.C.E.	Structural Engineering
(Assistant Professor of Structural Engineering)	
HARRY CAPLAN, Ph.D.	Greek
(Professor of Classics)	
WALTER BUCKINGHAM CARVER, Ph.D.	Mathematics
(Professor of Mathematics)	
CARL G. CHAMBERLAIN	Physical Education
(Director of Physical Education, Charlotte High School, Rochester)	
CARROLL D. CLARK, M.A.	Economics
(Associate Professor of Sociology, University of Kansas)	
C. A. CHOQUETTE	French
(Instructor in French, Colgate University)	
JOHN MONTGOMERY CLARKSON, M.A.	Mathematics
(Instructor in Mathematics)	
JACOB ROLAND COLLINS, Ph.D.	Physics
(Assistant Professor of Physics)	
LOUIS COWLES CONANT, M.A.	Geology
(Instructor in Geology)	
WILLIAM JAMES CONGDON, B.Chem.	Chemistry
(Assistant in Physical Chemistry)	
WALTER RODNEY CORNELL, B.S.	Mechanics
(Professor of the Mechanics of Engineering)	
CLYDE FIRMAN CRAIG, Ph.D.	Mathematics
(Assistant Professor of Mathematics)	
ROBERT EUGENE CUSHMAN, Ph.D.	Government
(Professor of Government)	
GEORGE IRVING DALE, Ph.D.	Spanish
(Professor of Romance Languages)	
IRENE DANNER, A.B.	Geology
(Public School Teacher, Collingswood, New Jersey)	
FRANCOIS DARRIEULAT	Physical Education
(Instructor in Physical Education)	
ALFRED LAURENCE DRESSER, Ph.D.	Chemistry
(Assistant in Inorganic Chemistry)	
CHARLES LOVE DURHAM, Ph.D., Litt.D.	Latin
(Professor of Latin)	
LEAMAN ANDREW DYE, A.M.	Mathematics
(Instructor in Mathematics)	
CHARLES DRUMMOND ELLIS, Ph.D., F.R.S.	Physics
(Fellow and Lecturer in Physics, Trinity College, Cambridge, England)	
JENNETTE EVANS, M.D.	Hygiene
(Assistant Professor of Hygiene and Medical Adviser of Women)	
SAMUEL FELDMAN, Ph.D.	Psychology
(Instructor in Psychology)	
DONALD LORD FINLAYSON, M.A.	Architecture
(Assistant Professor of Architecture)	
CLYDE FISHER, Ph.D., LL.D.	Education
(Curator of Education and Astronomy, American Museum of Natural History)	
ANGEL FLORES, M.A.	Spanish
(Instructor in Spanish)	

WILLIAM DANIEL FORGENG	Chemistry
(Assistant in Chemistry)	
FRANK SAMUEL FREEMAN, Ed.D.	Education
(Assistant Professor of Education)	
SIDNEY GONZALES GEORGE, C.E.	Mechanics
(Professor of Mechanics)	
ROSWELL CLIFTON GIBBS, Ph.D.	Physics
(Professor of Physics)	
DAVID CLINTON GILLESPIE, Ph.D.	Mathematics
(Professor of Mathematics)	
ADRIAN GORDON GOULD, M.D.	Hygiene
(Assistant Professor of Hygiene and Assistant Medical Adviser)	
GUY EVERETT GRANTHAM, Ph.D.	Physics
(Assistant Professor of Physics)	
OTHON GOEPP GUERLAC, Licencié ès lettres, Licencié en droit, M.A., LL.B.	French
(World War Memorial Professor of the Romance Languages and Literatures)	
ANDREW COMSTOCK HAIGH, A.B.	Music
(Assistant Professor of Music)	
CHARLES B. HALE, Ph.D.	English
(Associate Professor of English, University of Maryland)	
MARVIN THEODORE HERRICK	Public Speaking
(Assistant Professor of Public Speaking, University of Illinois)	
CARL JONES HOAGLAND, A.B.	Chemistry
(Assistant in Inorganic Chemistry)	
ALFRED GORDON HOUP	Chemistry
(Assistant in Inorganic Chemistry)	
PAUL THOMAS HOMAN, Ph.D.	Economics
(Professor of Economics)	
HARLEY EARL HOWE, Ph.D.	Physics
(Assistant Professor of Physics)	
ERIC VAIL HOWELL, M.C.E.	Mechanics
(Assistant Professor of Mechanics)	
MELVIN LOVELL HULSE, M.A.	Education
(Instructor in Education)	
WALLIE ABRAHAM HURWITZ, Ph.D.	Mathematics
(Professor of Mathematics)	
JOHN IRWIN HUTCHINSON, Ph.D.	Mathematics
(Professor of Mathematics)	
JOHN GAMEWELL JENKINS, Ph.D.	Psychology
(Assistant Professor of Psychology)	
JOHN RAVEN JOHNSON, Ph.D.	Chemistry
(Professor of Organic Chemistry)	
RIVERDA HARDING JORDAN, Ph.D.	Education
(Professor of Education)	
HENRY CROCKER KETCHAM, B.Chem.	Chemistry
(Professor of Organic Chemistry)	
HORACE KIDGER, M.A., LL.B.	Social Science
(Head of Department of Social Studies, High School, Newton, Mass.)	
ERNEST AUGUST KUBLER, Ph.D.	German
(Instructor in German)	
MAX LUDWIG WOLFRAM LAISTNER, M.A.	History
(Professor of Ancient History)	
ALBERT WASHINGTON LAUBENGAYER, Ph.D.	Chemistry
(Assistant Professor of Inorganic Chemistry)	
VIVIAN STREETER LAWRENCE, JR., B.S., M.E.	Mathematics
(Instructor in Mathematics)	
HOWARD SCOTT LIDDELL, Ph.D.	Physiology
(Professor of Physiology)	

WALLACE ROBERT McCONNELL, Ph.D.	Geology
(Professor of Geography, Miami University, Oxford, Ohio)	
FREDERICK GEORGE MARCHAM, Ph.D.	English History
(Professor of English History)	
MILTON DAVID MARX, Ph.D.	English
(Instructor in English)	
CLYDE WALTER MASON, Ph.D.	Chemistry
(Assistant Professor of Chemistry)	
JAMES FREDERICK MASON, Ph.D.	French
(Professor of the Romance Languages and Literatures)	
ALFRED MARTIN MEYER, A.M.	Education
(Director of Junior High School, Orlando, Florida)	
BENTON SULLIVAN MONROE, Ph.D.	English
(Assistant Professor of English)	
ROYAL EVERT MONTGOMERY, Ph.D.	Economics
(Assistant Professor of Economics)	
CLYDE B. MOORE, Ph.D.	Education
(Professor of Education)	
GUY BROOKS MUCHMORE, A.B.	Public Speaking
(Assistant Professor of Public Speaking)	
D. E. MURRAY, A.B.	Physical Education
(Director of Physical Education, Madison Junior High School, Rochester)	
FRANK L. MYERS	Physical Education
(Teacher, Bernardsville, New Jersey)	
CHARLES MERRICK NEVIN, Ph.D.	Geology
(Assistant Professor of Geology)	
MELVIN LORREL NICHOLS, B.Chem., Ph.D.	Chemistry
(Assistant Professor of Chemistry)	
CLARK SUTHERLAND NORTUP, Ph.D.	English
(Professor of English and Librarian of the Hart Memorial Library)	
ROBERT MORRIS OGDEN, Ph.D.	Education
(Professor of Education and Dean of the College of Arts and Sciences)	
CHARLES EDWARD O'ROURKE, C.E.	Engineering
(Assistant Professor of Structural Engineering)	
JACOB PAPISH, Ph.D.	Chemistry
(Professor of Chemistry)	
LOUIS JOHN PARADISO, M.A.	Mathematics
(Instructor in Mathematics)	
FRANK E. PERCIVAL	Music
(Head of Department of Music, State Teachers College, Stevens Point, Wis.)	
MILES ALBION POND, Ph.B.	Descriptive Geometry
(Assistant Professor of Civil Engineering)	
PAUL RUSSEL POPE, Ph.D.	German
(Professor of German)	
HAROLD LYLE REED, Ph.D.	Economics
(Professor of Economics and Finance)	
NELLIE REUSCHEL	Music
(Instructor in Dalcroze Eurhythmics, New York Institute of Musical Art)	
FRED STILLMAN ROGERS, M.E.	Kinematics
(Professor of Machine Design)	
WILLIAM C. RUEDIGER, Ph.D.	Education
(Dean of Teachers College, George Washington University)	
MARY C. RYAN	Physical Education
(Instructor in Physical Education)	
GERALD DEWITT SANDERS, Ph.D.	English
(Head of Department of English, Michigan State Normal School, Ypsilanti)	
ERNEST WILLIAM SCHODER, Ph.D.	Hydraulics
(World War Memorial Professor of Experimental Hydraulics)	
HERBERT HENRY SCOFIELD, M.E.	Engineering
(Professor of Testing Materials)	

THE SUMMER SESSION

FRANCIS ROBERT SHARPE, Ph.D.	Mathematics
(Professor of Mathematics)	
HAROLD ROBERT SMART, Ph.D.	Philosophy
(Assistant Professor of Philosophy)	
DEAN FRANKLIN SMILEY, M.D.	Hygiene
(Professor of Hygiene and Medical Adviser)	
HAROLD D. SMITH, A.B., Mus.D.	Music
(Assistant Professor of Music)	
VIRGIL SNYDER, Ph.D.	Mathematics
(Professor of Mathematics)	
L. E. SPOCK, Ph.D.	Geology
(Assistant Professor of Geology, New York University)	
ALFRED SPOUSE.	Music
(Supervisor of High School Music, Rochester, N. Y.)	
WALTER HUTCHINSON STANTON, Ph.D.	Public Speaking
(Assistant Professor of Public Speaking)	
WALTER KING STONE.	Drawing and Painting
(Assistant Professor of Drawing)	
MARCELLUS H. STOW, M.A.	Geology
(Assistant Professor of Geology, Washington and Lee University)	
WILLIAM STRUNK, JR., Ph.D.	English
(Professor of English)	
RALPH COLTON TALLMAN, A.B.	Chemistry
(Instructor in Chemistry)	
CHARLES KENNETH THOMAS, A.B.	Public Speaking
(Assistant Professor of Public Speaking)	
HAROLD G. THOMPSON, A.B.	Latin
(Supervisor of Ancient Languages, New York State Department of Education)	
CHARLES CHAPMAN TORRANCE, A.M.	Mathematics
(Instructor in Mathematics)	
CLARENCE ELLSWORTH TOWNSEND, M.E.	Mechanical Drawing
(Professor of Drawing in the College of Engineering)	
DAVID WOOLSEY TRAINER, JR., Ph.D.	Geology
(Instructor in Geology)	
LEONARD CHURCH URQUHART, C.E.	Structural Engineering
(Professor of Structural Engineering)	
PAUL WENDELL VITTUM, A.B.	Chemistry
(Assistant in Organic Chemistry)	
OSCAR DIEDERICH VON ENGELN, Ph.D.	Geography and Geology
(Professor of Physical Geography)	
RUSSELL HALDERMAN WAGNER, Ph.D.	Public Speaking
(Assistant Professor of Public Speaking)	
KENNETH LELAND WASHBURN, B.F.A.	Drawing and Painting
(Instructor in Freehand Drawing)	
HARRY PORTER WELD, Ph.D.	Psychology
(Professor of Psychology)	
ARTHUR PRESTON WHITAKER, Ph.D.	History
(Professor of American History)	
HERBERT AUGUST WICHELNS, Ph.D.	Public Speaking
(Assistant Professor of Public Speaking)	
CHARLES OLIVER WILLITS, M.S.	Chemistry
(Assistant in Quantitative Analysis)	
P. N. WOOLSEY.	French
(Reader in Romance Languages)	
CHARLES VAN PATTEN YOUNG, A.B.	Physical Education
(Professor of Physical Education and Director of the Gymnasium)	
KARL ABELL ZELLER, Ph.D.	Physics
(Teacher of Science, High School, Columbus, Ohio)	

OBJECT OF THE SESSION

INSTRUCTION ADAPTED TO VARIOUS NEEDS

The primary object of the Summer Session is to advance education by helping those engaged in it. The instruction is adapted to the needs of the following classes:

1. Professors and teachers in colleges and schools, superintendents, and supervisors of special branches of instruction.

The announcements of the different departments show a wide range of work. This work is either advanced and, therefore, suited to specialists who wish to pursue their individual study; or more elementary and adapted to teachers who desire to start in a new field. In addition to the instruction of the classroom, the University's libraries, museums, laboratories, and shops are open for use.

2. College students in Cornell or other universities who wish to make some scholastic use of the long vacation, especially those whose college studies may for one reason or another have been interrupted. Graduates may count some of the courses toward an advanced degree. See the Announcement of the Graduate School with regard to opportunities for advanced work and research during the summer.

Undergraduates who are in good standing academically may anticipate requirements and thereby shorten their course, or may make up existing deficiencies. The conditions for receiving credit, and the amount which may be obtained, are stated below, under the head of Academic Credit for Work.

3. Students entering the University and wishing to obtain surplus credit at entrance, or to complete the entrance requirements.

It often happens that students have in June more or less than the requirements for admission to college. The Summer Session affords them the opportunity either to add to their surplus and thus, in some cases, to gain a year in time; or to make up their deficiency.

4. All persons qualified to pursue with profit any course given, whether or not they are engaged in formal study or teaching.

ACADEMIC CREDIT FOR WORK

IN THE COLLEGE OF ARTS AND SCIENCES

The academic requirements for the degree of Bachelor of Arts are the completion of one hundred and twenty hours of elective work. Before graduation a student must complete six hours in each of certain specified groups of study, thirty of these hours during the first two years, under certain restrictions (the underclass requirements). During his last two years he must also elect twenty hours in some one department or group of related departments (the upperclass requirements).

To obtain credit toward the Cornell degree by means of work done in Summer Sessions, a student must have previously satisfied the entrance requirements of the College, and must obtain in advance the

Dean's approval of his selection of courses. He may then obtain in any Summer Session credit for the number of hours he passes, with a minimum of four or a maximum of eight in each Session. Credit for thirty hours, but no more, may be secured in this way.

The Summer Session records of students registered in the College of Arts and Sciences are reviewed by the usual standing committees of the College, and poor records in the Summer Session are liable to the same penalties as in the regular University session.

The foregoing regulations apply to students matriculated at Cornell. Undergraduates enrolled in other institutions and wishing to have credits earned in the Summer Session applied on their work at such other institutions should, before coming to Ithaca, consult their own college authorities and make all arrangements by them deemed necessary. The Cornell Summer Session can assume no responsibility for the use to be made of credits earned by students thus coming from other places of study. The certificates mentioned on page 12 will show what courses have been taken, the amount of credit in terms of Cornell "hours," and the grades.

IN OTHER COLLEGES OF THE UNIVERSITY

The nature and amount of credit allowed in other colleges at Cornell for work in the Summer Session may be learned from the statements under the announcement of each course.

IN THE GRADUATE SCHOOL

A graduate of any college whose requirements for a first degree are substantially equivalent to those for the first degree at Cornell may be admitted to resident study in the Graduate School. He may at once enter upon candidacy for an advanced degree if he is able to show that he has had adequate preliminary training in the subjects in which he proposes to work. The requirements for the degree do not depend primarily on the completion of any prescribed number of courses or of a fixed term of residence. They are rather based upon actual achievement in scholarship and research in the fields indicated by the major and minor subjects. The writing of a thesis and the passing of a special examination are also required; except that for the degrees of Master of Arts in Education and Master of Science in Education the thesis may be waived in consideration of certain other requirements.

Not all work done by a graduate student is graduate work in the strict sense of the term. Graduate work to be considered acceptable for a degree must be of advanced character in some field or department of knowledge. No residence towards a master's degree will be granted any student who does not register with the Dean of the Graduate School within three days after the opening of the Session, and who does not formally become a candidate for this degree under the direction of a special committee; see below. The latest day for such registration in 1931 is July 9.

Students of the University Summer Session, of the Summer School of Biology, and of the New York State Summer Session who have been admitted to candidacy for an advanced degree are required to pay the regular tuition fee of the session, sixty dollars, but are exempt from tuition and administration fees in the Graduate School. On registering for the first time as candidates, students who have not previously matriculated in Cornell University will pay in addition the regular matriculation fee of ten dollars. See the full statement of fees in the Graduate School on page 14.

The residence requirements for the Master's degree may be fulfilled in whole or in part by attendance during the Summer Session of the University. For this purpose, two Summer Sessions will be regarded as the equivalent of one term, and four Summer Sessions as the equivalent of one year, the minimum period of residence for this degree. Candidates for this degree who are in residence during Summer Sessions only are also required to continue their studies during the year under the direction of the chairman of the special committee in charge of their work.

The residence requirements for the Doctor's degree may, upon recommendation of the student's special committee, be fulfilled in part by attendance during the Summer Session. For this purpose, two summer sessions will be regarded as the equivalent of one term, and four summer sessions as the equivalent of one year. The last year of required residence must be spent in study during regular sessions at Cornell University.

Any person wishing to become a candidate for an advanced degree and to study during the Summer Session is advised to write to the professor whose work he expects to take, and also to the Dean of the Graduate School, asking for a blank form of application for admission to the Graduate School. It is much better to make these arrangements before coming to Ithaca, thus avoiding delay and interruption of study after the Summer Session has begun. In this way, moreover, it may be possible to secure the advice and guidance of professors in fields of study of which no specific mention is made in the announcements. Not all departments formally offer graduate work. In some departments, notably in the Summer School of Biology, opportunities for research may be had for a longer period than the six weeks during which courses are formally conducted.

Each student, upon entering the Graduate School, must choose a field of study. Within that field, the branch of knowledge to which he intends to devote the larger part of his time is termed his major subject; the other subject or subjects, which will necessarily be more restricted in their scope and which should be selected with reference to their bearing on the major subject, are termed the minor subjects.

The degree of Master of Arts in Education and of Master of Science in Education is offered to candidates regularly qualified to enter the Graduate School. These degrees are designed for school executive officers and teachers who do not wish to enter upon the more re-

stricted program of study involving intensive research, or who wish to supplement previous training in order to meet advanced professional requirements for certification. Suggested programs of study for such candidates have been prepared, subject to modification to suit individual needs. Complete information regarding such programs may be obtained by addressing the Chairman of the Division of Education, Sage College, Ithaca, N. Y.

The work of each graduate student who is a candidate for an advanced degree is in charge of a special committee consisting of the teachers under whom his major and minor studies are pursued, a representative of his major subject being chairman. The student is expected to confer freely with the members of his special committee, both in regard to the general plan of his work and in connection with individual courses of study. A student upon registering in the Summer Session with the intention of doing graduate work as a candidate for an advanced degree must also register with the Dean of the Graduate School and present to him a statement of his major and minor subjects approved by the members of his special committee.

In certain departments an invitation is issued to scholars who are beyond the stage of regular graduate study to make use of the resources of the University in these fields for carrying on research.

CERTIFICATES FOR WORK DONE

Students of the Summer Session who are not matriculated in the University may receive certificates of attendance and of work satisfactorily performed. Application for them must be made before August 10, and the applicant must leave at the office of the Registrar a large-sized envelope stamped and directed to his home address. The certificate will then be forwarded by mail. The regulations of each department for the granting of a certificate must be met.

GENERAL INFORMATION

CONDUCT AND SCHOLARSHIP

The Summer Session is conducted under the same general regulations concerning conduct and scholarship as apply during the academic year. For this reason students are requested to familiarize themselves with dormitory and other rules, and to abide by them. The officers of the University also reserve the right to cancel the registration of any student at any time for neglect of scholastic duties. The rules governing student conduct are:

"A student is expected to show both within and without the University unfailing respect for order, morality, personal honor, and the rights of others. The authority to administer this rule and to impose penalties for its violation is vested in the University Committee on Student Affairs. The rule is construed as applicable at all times, in all places, to all students of the University. A student may at any time be removed from the University if, in the opinion of the Committee on Student Affairs, his presence is not conducive to the University's best interests."

ADMISSION

There are no examinations for admission to the Summer Session. Each person must, however, satisfy the instructor in charge of every course he intends to take, unless it be elementary, that he is qualified to pursue the work.

An undergraduate student who is registered in a college at Cornell or elsewhere and who wishes to enter the Summer Session must secure from his dean or other competent authority a certificate of good standing. Students on probation are regarded as not in good standing and accordingly are not admitted. A blank form of certificate may be had on application to the Secretary of the Summer Session.

Undergraduate students whose names have been removed from the rolls of any college at Cornell University are not admitted to the Summer Session except upon the recommendation of the college concerned. Students whose names have been removed from the rolls of any college not at Cornell are not admitted to the Summer Session under any circumstances.

There are some special requirements to be met by applicants for admission to the summer session of the Law School, and such persons should consult the separate announcement of that session.

Admission to the classrooms during the Summer Session is restricted to students duly registered for the session. A student thus duly registered may occasionally visit any class; but if he wishes to attend regularly without credit he must secure special permission from the Chairman of the Summer Session. Such permission will be granted only when the student can show a serious purpose in such attendance.

If a student entering the Summer Session wishes his work to count toward a degree, there are certain regulations that he must comply with, and he will find them set forth under the head of Academic Credit for Work, page 9.

REGISTRATION

All students of the Summer Session are required to register with the Registrar of the University. The hours and places of registration are given in the Calendar of the session, on page 3. Students may register on Monday, July 6, between 8 A. M. and 5 P. M., or on the day of their arrival, if they reach Ithaca on July 7, or later. They are urged to register on July 6. Registration before that day is not required, and it is not necessary to apply in advance for registration blanks.

Beginning on Tuesday, July 7, the Registrar's office in Morrill Hall will be open from 9 A. M. till 4 P. M. every week day except Saturday, when it will be closed at noon.

Students who wish to obtain credit for graduate work to be done during the Summer Session must register not only with the Registrar but also with the Dean of the Graduate School, at his office in Room 22, Morrill Hall.

Persons who are to take courses in the New York State Summer Session and in any department of the Summer Session of the University must register for both the Summer Session and the New York State Summer Session. They are required to pay only one tuition fee.

TUITION

The charge for tuition in the Summer Session of the University is sixty dollars. In the summer session of the Law School it is one hundred thirty-five dollars for the whole session of eleven weeks, or seventy dollars for one term of five and one-half weeks.

The tuition fee is payable in full, on the first registration day or within the next five days, at the office of the Treasurer, Morrill Hall.

Students in the Graduate School are required to pay fees as follows:

An administration fee of \$12.50 for each term of the academic year.

A tuition fee of \$75.00 for the academic year (\$37.50 each term).

If taking work in any of the summer courses all students must register both in the Graduate School and such summer course or courses, and pay a tuition fee equal to that of the University Summer Session.

No student shall receive the master's degree who has not paid tuition equivalent at least to one academic year, during the academic year, or summer courses, or both; and no one shall receive the doctor's degree who has not paid tuition for the equivalent of at least three academic years, unless one or more of the years spent in study for the doctor's degree shall have been spent in approved graduate study at another university—but in any event at least the equivalent of one academic year's tuition must be paid while in graduate study at the University.

Any student of the Graduate School who has completed the requirements of residence for the degree for which he is a candidate, whose studies have been satisfactory to the Faculty as evidenced by a certificate to that effect signed by the Dean of the Graduate School,

and who during that time has satisfied the requirements as to tuition fees, is, on paying the regular administration fees of each subsequent term or summer course exempt from the further payment of tuition fees for a period not to exceed one academic year, or the equivalent four summer courses.

To those entitled to exemption from summer course tuition fees, an administration fee of \$6.25 for each summer's work is charged. To be specific, a candidate for the degree of Master of Arts will pay a tuition fee of \$60 (plus an administration fee of \$6.25) for his first summer, of \$15 (plus an administration fee of \$6.25) for his second summer, and for each of the succeeding four summers an administration fee of \$6.25.

On registering for the first time as a candidate, a student who has not previously matriculated in Cornell University, must pay a matriculation fee of \$10.00 in addition to any other fees. This fee is not refundable.

If registered during the summer under Personal Direction students are required to register with the Registrar as well as in the Graduate School and to pay an administration fee of \$10.00.

If registered under Personal Direction, a student in the Graduate School who is not exempt from summer course tuition fees, may be permitted, upon joint approval of the Professor directing his work and the Chairman or Director of any of the summer courses, to take one or more subjects in any of such courses upon the payment of such part of the regular tuition fees (pro rata or otherwise) as may be determined by the administrative board of the particular summer course.

Any student who fails to pay his tuition charges, other fees, and other indebtedness to the University, or who, if entitled to free tuition, fails to claim it at the Treasurer's office and to pay his fees and other indebtedness, within the prescribed period of grace, is thereby dropped from the University unless the Treasurer has granted him an extension of time to complete payment. The Treasurer is permitted to grant such an extension, when in his judgment, the circumstances of a particular case warrant his doing so. For any such extension the student is assessed a fee of \$5 for the first week and \$2 additional for each subsequent week in which the whole or any part of the debt remains unpaid, but the assessment in any case is not more than \$15. The assessment may be waived in any instance for reasons satisfactory to the Comptroller and the Registrar, when such reasons are set forth in a written statement.

If a student withdraws from the Summer Session, the Treasurer may refund a part of the tuition fee or cancel a part of the obligation that the student has incurred for tuition, provided the reason for the withdrawal be stated in writing and be satisfactory to the Comptroller and the Registrar. In such a case the student is required to pay twenty-five per cent of the term's tuition for each week or fraction of a week between the first registration day and the date of his certificate of withdrawal.

Students registering at any time during the last four weeks of the Summer Session or of either term of the summer session of the Law School are required to pay for the remainder of the term at the rate of twenty-five per cent of the term's tuition for each week or fraction of a week between the date of registration and the last examination day of the term.

Any tuition fee or other fee may be changed by the Trustees to take effect at any time without previous notice.

IN THE NEW YORK STATE SUMMER SESSION

Tuition in any of the undergraduate courses of the Summer School of Agriculture and of the Summer School of Home Economics is free to admitted students who are residents of the State of New York and who have been residents for at least one year immediately preceding registration. An *incidental fee of ten dollars* is, however, charged to all students for admission. Students from outside the State of New York, whether they take one subject or more, are required to pay sixty dollars, in which is included the incidental fee.

Free tuition does not include instruction in the Summer School of Biology or any instruction outside the College of Agriculture and the College of Home Economics, nor are students receiving free tuition permitted to attend classes outside the College of Agriculture and the College of Home Economics.

Graduate students who register in the New York State Summer Session as candidates for advanced degrees are required to pay the regular tuition fee of sixty dollars. If they have not previously matriculated in Cornell University, they must also pay a matriculation fee of ten dollars. See page 62.

OTHER FEES

In *Chemistry* a laboratory fee is charged for material actually consumed. A deposit of such amount as the instructor may prescribe must be made with the Treasurer.

Physics. For laboratory fees in physics see descriptions of courses.

In *Geography and Geology*, in Course S 8 and in Course S 9 a fee of one dollar must be paid in advance to the Treasurer to cover incidental expenses of the course.

In *Drawing and Painting*, Course S 7, a fee of ten dollars is required.

In *Public Speaking*, Course S 45, a special laboratory fee of five dollars is required.

In *Music*, Course S 3A, Delcroze Eurhythmics, a special fee of ten dollars is required.

Biology. A laboratory fee is charged for each course in Biology, the fee varying with the character of the course. The amount which the student must expect to pay upon beginning any course is stated in the description of that course, under the head of Summer School of Biology, page 55.

Swimming. A special charge of ten dollars is made for the instruction in Swimming.

Tennis. A special charge of ten dollars is made for instruction in Tennis.

Fencing. A special charge of ten dollars is made for instruction in Fencing.

Shop-work. Students not matriculated in the College of Engineering of Cornell University are required to pay a fee of \$3.50 for each credit hour of shop-work for which they register.

Library. A person who obtains the privilege of taking books from the University Library for home use is required to make a deposit of five dollars, which will be refunded upon the return of all books taken out.

Willard Straight Hall. A fee of three dollars is charged for the privileges of Willard Straight Hall. See page 21.

RESIDENTIAL HALLS: ROOMS: BOARD

FOR WOMEN

The University has three groups of residential halls for women in which board and room can be obtained during the Summer Session by registered students only. They are:

Sage College, which accommodates 175 persons. Here the charge for room and a specified amount of laundry, for the session, is from \$27 to \$42, according to the size and location of the room.

Prudence Risley Hall, which accommodates 184 persons. Here the charge for room, board, and a specified amount of laundry, for the session, is from \$87 to \$96, according to the size and location of the room.

The Balch Halls (four units), which accommodate 318 persons. Here the charge for board, room, and a specified amount of laundry, for the session, is \$101.

Besides these halls, there are certain *approved houses* which are occupied exclusively by women and which, like the halls, are under the direct supervision of the Dean of Women.

Undergraduate women students of Cornell and other colleges and other women students under twenty-one years of age are expected to live in the residential halls or the approved houses. Any woman student should consult the Dean of Women before engaging a room.

In the residential halls for women the charge for room and board includes lodging Saturday night, July 4 (not earlier), breakfast Sunday July 5, and all meals to and including breakfast Saturday, August 15.

Members of the Summer Session who lodge outside Prudence Risley Hall and the Balch Halls may obtain table board at any of those halls for \$10 a week.

Each of the residential halls is in charge of a warden, who is glad to know the students, to advise them in illness or other emergency, and to give them whatever information they wish about the University or the town. It is understood that persons living in the halls will conform to the house regulations made for the convenience and comfort of all.

Application for rooms in any of the residential halls or approved houses for women should be made to the Manager of Residential Halls, Morrill Hall, Ithaca, N. Y. Information about such rooms may be obtained from the Manager in advance of the application. The list of approved houses will be available after June 1 on application to the Manager, and also, if desired, a supplementary list of private houses

with desirable rooms available for mature women who prefer to live outside any of the halls or approved houses. Checks should be drawn to the order of Cornell University.

A deposit of five dollars must accompany each application for a room in any of the residential halls; otherwise the application will not be entertained. The rooms are reserved in the order of application. If a room assigned is occupied by the applicant, the amount of the deposit is held until the end of the session to cover the return of keys and any damage to building or furniture other than ordinary wear and tear, and to insure the completion of the lease. The deposit will be refunded if the applicant gives formal notice to the Manager on or before June 15 that she wishes to withdraw her application.

FOR MEN

Men regularly enrolled in the Summer Session can obtain comfortable rooms either in the New Residential Halls for Men, which are thoroughly modern and of fireproof construction, or in Cascadilla Hall, which is an older building with modern fixtures and furnishings.

In the *New Residential Halls* the charge for furnished room, including care of the room and laundry of bed linen, is \$21 for the session. There are a few suites at a higher rate, and some rooms on the top floor may be had for less.

In *Cascadilla Hall* the charge for furnished room, including care of the room and laundry of bed linen, is from \$15 to \$30 for the session, according to the size and location of the room.

Board can be obtained for an average of \$1 to \$1.50 a day in Willard Straight Hall or in other dining rooms or restaurants on or near the campus.

Applications for rooms in the New Residential Halls for Men or in Cascadilla Hall, or for plans of the rooms or other information about them, should be made to the Manager of Residential Halls, Morrill Hall, Ithaca, N. Y. Checks should be drawn to the order of Cornell University.

A list of private houses offering desirable rooms for rent for the session can be obtained after June 1 by application to the Manager of Residential Halls, Morrill Hall, Ithaca, N. Y.

THE COST OF LIVING

An estimate of the cost of living in Ithaca in the summer can be made by consulting the figures given above. In a private house a student may be able to rent a room at a little less cost for the session than in one of the residential halls. Rooms are rented with the understanding that they will be occupied for the entire session unless both parties agree otherwise. Table board is generally engaged by the week.

MEANS OF SELF-SUPPORT

Students, either men or women, who wish to earn a part of their expenses during the session are invited to correspond in advance with the Manager of Residential Halls, Morrill Hall, Ithaca.

THE CASHING OF CHECKS

The Treasurer of the University accepts checks in settlement of charges payable at his office, but a rule of the Board of Trustees forbids him to cash any credit instrument, even to the extent of accepting a check or draft in amount greater than the sum due and returning the excess in cash. Students are therefore advised to open an account in an Ithaca Bank as soon as they arrive in town, or else provide themselves with travelers' checks, drafts on New York City banks, money orders, or other form of credit instrument such as a bank will cash in the ordinary course of business.

THE STUDENT'S HEALTH

MEDICAL ADVICE

The University's staff includes medical advisers of men and of women, with a corps of assistants. The medical advisers observe regular office hours, from 9 A. M. till 1 P. M. daily, at the medical offices in the Old Armory. A trained nurse is on duty from 2 P. M. till 4 P. M. daily. No charge is made for these services.

In cases of illness or indisposition which involve absence from classes even for one day, students are expected to report immediately either in person, by telephone, or by messenger to the medical adviser's office. For the convenience of the adviser such illness should be reported early in the day. Students indisposed but still able to attend classes should consult the medical adviser immediately in order that advice may be given and that diagnosis of incipient diseases may be made promptly. Any student failing to report as soon as possible to the medical adviser any contagious or infectious disease will be regarded as guilty of a serious breach of discipline.

A medical examination is not required of students in the Summer Session.

A student may at any time be requested to withdraw from the University if, in the opinion of the University authorities, the condition of his health is such as to make it unwise for him to remain.

Every student matriculating in Cornell University must present a certificate showing that he has been vaccinated within five years. Students in the Summer Session are not matriculated students and of them accordingly such vaccination certificate is not required. If, however, students attending the Summer Session should matriculate in any of the colleges of the University or in the Graduate School, they must give evidence of recent vaccination like others so matriculated.

THE UNIVERSITY INFIRMARY

The University Infirmary occupies three large buildings near the campus. The first of these, a brownstone structure, was the home of Henry Williams Sage, for many years chairman of the Board of Trustees of the University. After his death in 1897, his sons, Dean and William Henry Sage, endowed it and gave it to the University for a

student's infirmary as a memorial to their father. The second building, the Schuyler House, was purchased in 1911; in 1912 the Trustees erected a third building, fireproof, and this is the present main hospital building. The normal capacity of the Infirmary is seventy-five beds; the number can be doubled in an emergency.

The Infirmary, which is in charge of an experienced superintendent and is thoroughly equipped, provides suitable rooms, food, and nursing for sick students. It has no medical staff; students find their own physicians among practitioners in Ithaca or elsewhere.

Students in the Summer Session have all the privileges of admission to the Infirmary. They pay no fee in advance, but are liable to regular charges for services rendered.

THE LIBRARIES

The University Library is open on week days from 8 A. M. till 10:30 P. M. In this building are the main library, containing about 500,000 volumes, and most of the seminary and special libraries. The main reading room affords accommodations for more than two hundred readers, and contains a selected library of about 8,000 volumes of reference works. Below stairs is the periodical room in which are kept the current numbers of about 500 journals in various fields of knowledge. These rooms are open to all students. Students properly qualified are allowed the use of the seminary rooms and the books in them. The main collection is primarily a library of reference for use in the building. Students are, however, to a limited extent, allowed to take out books for home use. Persons wishing this privilege must make a deposit of \$5, which will be refunded upon the return of all books taken out.

The reference library in Goldwin Smith Hall is open for the use of summer students from 9 A. M. till 5 P. M. on week days except Saturday, when it is closed at noon.

The library of the Law School numbers more than 56,000 volumes and about 5,800 pamphlets, to which generous additions are made yearly. It includes the library of the late Nathaniel C. Moak of Albany, N. Y., which was presented in 1893 by Mrs. A. M. Boardman and Mrs. Ellen D. Williams, as a memorial to Judge Douglas Boardman, the first dean of the School. In reports of the federal courts, and of the several American state jurisdictions, and in English, Scotch, Irish, Canadian, Australian, and English colonial reports, the law library is practically complete to date.

The Library of the College of Agriculture, in the basement of Stone Hall, is open on week days from 9 A. M. till 5 P. M., except Saturday, when it is closed at 1 P. M. In it will be found a large collection of bulletins and reports of experiment stations, reference books on agriculture and country life, agricultural periodicals, and the like. The entomological library, in the department of entomology on the fourth floor of Roberts Hall, is one of the most complete of its kind in the United States. Nearly all of the departments in which instruction is given have well-selected departmental libraries.

WILLARD STRAIGHT HALL

All privileges of Willard Straight Hall, the social center of the University, are open to Summer Session students, both men and women, as during the regular college year. In accordance with the regular procedure, a fee of \$3 is required of all summer registrants, payable at the time of the regular tuition fee.

SAGE CHAPEL

Religious services are conducted in Sage Chapel throughout the academic year by clergymen of various religious denominations. There will be services in the Chapel on five Sundays during the Summer Session, July 12 to August 9 inclusive.

LECTURES: MUSICAL RECITALS: EXCURSIONS

In addition to the regular classroom work there will be general public lectures on Monday evenings, and also lectures of general interest each week in connection with the work of various departments. They will be all announced in the Weekly Calendar.

Organ recitals will be given on Tuesday evenings in Sage Chapel and on Sunday evenings in Bailey Hall. Piano recitals will also be given. These entertainments are free to all students.

Wednesday evenings are devoted to the departmental conferences, which are open to all interested persons. Notice of these conferences will be given from week to week.

Excursions, in connection with the work of certain departments, are made to many points of interest. Some of them are open to all members of the Summer Session. Especially noteworthy are the excursions to Watkins Glen and to Niagara Falls.

RAILROAD ROUTES TO ITHACA

Ithaca can be reached from New York City by either the Delaware, Lackawanna & Western or the Lehigh Valley Railroad. On both roads there are good trains, with Pullman cars, both night and day. Passengers from the west reach Ithaca by way of the Lehigh Valley Railroad from Buffalo. From stations on the Boston & Albany Railroad, the shortest route to Ithaca is by way of Syracuse and Auburn. From Philadelphia, and from Baltimore, Washington, and the south by way of the Baltimore & Ohio, the Philadelphia & Reading connects with the Lehigh Valley at Bethlehem. From stations on the Erie, connections with Ithaca can be made either by the Lackawanna at Owego or by the Lehigh Valley (Elmira and Cortland branch) at Elmira. Ithaca has connections with the New York Central at Geneva, Auburn, and Canastota.

COURSES OF INSTRUCTION

Subjects of instruction are in alphabetical order.

Most of the courses consist of five exercises a week, or one hour each week day except Saturday. The number of actual hours of class work in any course can be found by multiplying the number of weekly exercises by six.

Since instruction begins on Tuesday, all classes scheduled for five meetings a week will meet as usual on the first Saturday, July 11.

GS signifies *Goldwin Smith Hall*.

ANTHROPOLOGY

S 1. Anthropology. Credit two hours. Daily except Sat., 12. GS A. Dr. BATES.

An introductory course dealing with the archaeological, ethnological, and physical aspects of primitive man. Relationships of existing primitive and backward races in America.

ASTRONOMY

S 1. General Astronomy. Credit two hours. Lectures and recitations, daily except Sat., 8. Lincoln 31. Professor BOOTHROYD.

S 2. Laboratory Astronomy. Credit one hour. Laboratory, T and Th, 7:30 to 10 p. m. Observatory. This course must be preceded or accompanied by Course S 1. Professor BOOTHROYD.

These two courses together offer an introduction to astronomical ideas and methods and give an especially good background for teachers who may wish to prepare more thoroughly for teaching general science or geography. Those who take both courses may count the three hours toward fulfilling the requirement of Group 4 in the College of Arts and Sciences.

The lectures are illustrated by models and by lantern slides. The 12-inch equatorial and other instruments of the Observatory are used for observation and instruction.

Fath's *Elements of Astronomy* and Thomas's *Heaven and Earth* are used as reference books in Course S 1; and Stetson's *Manual of Laboratory Astronomy* is used along with Fath's *Elements of Astronomy* in Course S 2.

AVIATION

The course in aeronautics sponsored by the Cornell Flying Club will be open to Summer Session students, without university credit. Topics included: aerodynamics and theory of flight, airplane motors, navigation and meteorology. Instruction by regular members of the University staff. Lectures, M W F, 2-3:30. West Sibley 1. Fee, \$17.50.

The course will not be given if fewer than eight students apply. For further information address Mr. F. B. Wright, Department of Agricultural Engineering, Ithaca, New York.

CHEMISTRY

The courses announced below correspond entirely or in part with courses given during the regular sessions of the University. For regular students the requirements for admission to the various courses will be the same as during the year.

Teachers may be admitted to any course for which their general training or experience may be considered to prepare them. Every effort will be made to meet the individual needs of teachers by arranging and modifying the work as far as possible so as to fulfill the particular requirements in each case.

All courses in Chemistry are given in the *Baker Laboratory of Chemistry*.

S 101. Introductory Inorganic Chemistry. Credit three hours. Lectures, daily except Sat., 12. Ten additional lectures at hours to be arranged. *Main Lecture Room.* First three weeks, Assistant Professor LAUBENGAYER and Mr. HOUP; second three weeks, Professor BROWNE and Mr. HOUP.

The lectures deal with the fundamental theories and laws of chemistry, and with the more common elements and their compounds. They are profusely illustrated by experiments. The course is primarily designed to meet the needs of teachers in secondary schools, and to that end emphasis is laid upon methods of lecture presentation and experimental demonstration. Students other than teachers must, before registering, satisfy the department that they are properly prepared to carry on the work.

S 105. Introductory Inorganic Chemistry. Recitations and laboratory practice. Credit three hours.

Laboratory, M W, 8-12, and T Th F, 9-12. *Rooms 177 and 150.* Assistant Professor LAUBENGAYER and Mr. HOAGLAND. A series of experiments designed to illustrate the fundamental laws of chemistry and to acquaint the student with the properties of the principal elements and their compounds. For the benefit of teachers who may take the course special attention will be given to the methods of laboratory instruction, quantitative experiments, and the blowing of simple glass apparatus.

Recitations, T Th F, 8. *Room 22.* Assistant Professor LAUBENGAYER and Dr. DRESSER. The recitations deal with the subject matter of the lectures and with the experimental work in the laboratory and afford thorough drill in the solution of chemical problems.

S 205. Introductory Qualitative Analysis. Credit three hours. Must be taken with Course S 206. Lectures and recitations, daily except S, 8, T Th, 11. *Room 22.* Mr. AVENS.

A study of the application of the theories of general chemistry to the systematic separation and detection of the common elements and acid radicals.

S 206. Introductory Qualitative Analysis. Credit three hours. Must be taken with course S 205. Laboratory, daily except S, 1:40-4, and M W, 9-12:30. *Room 50.* Mr. AVENS and Mr. BAKER.

A study of the properties and reactions of the common elements and acid radicals; the qualitative analysis of a number of solutions and solid compounds.

S 210. Introductory Qualitative Analysis. Shorter course. Lectures and laboratory practice. Credit three hours. Lectures, M W F, 11. *Room 22.* Mr. AVENS. Laboratory, daily except S, 1:40-4. *Room 50.* Mr. AVENS and Mr. BAKER.

The properties and reactions of the common elements and acids, and their detection in various liquid and solid mixtures.

S 220. Introductory Quantitative Analysis. Credit three hours. Must be taken with Course S 221. Lectures and recitations, daily except S, 8. *Room 202.* Assistant Professor NICHOLS.

A study of the fundamental principles of gravimetric and volumetric analysis with practice in stoichiometry.

S 221. Introductory Quantitative Analysis. Credit three hours. Must be taken with Course S 220. Laboratory, daily except S, 9-1. *Room 294.* Assistant Professor NICHOLS and Mr. WILLITS.

Laboratory practice in the preparation and standardization of various volumetric solutions and the analysis of a variety of substances by volumetric and gravimetric methods.

S 225. Introductory Quantitative Analysis. Shorter course. Lectures and laboratory practice. Credit three hours. Lectures, T Th, 11. *Room 207.* Assistant Professor NICHOLS. Laboratory, daily except S, 8-11. *Room 294.* Assistant Professor NICHOLS and Mr. WILLITS.

The preparation and use of volumetric solutions and work in elementary gravimetric analysis.

S 230. Advanced Quantitative Analysis. Recitations and laboratory practice. Credit two to four hours. Laboratory, daily except S, 8-1. *Room 294.* Assistant Professor NICHOLS and Mr. WILLITS.

Gravimetric, volumetric, and electrolytic methods of analysis, and methods of combustion analysis; the calibration of weights and volumetric apparatus, analysis of iron and steel alloys, silicates, etc.

S 305. Introductory Organic Chemistry.

It is recommended that S 305 A and S 310 A be taken in one summer, and that S 305 B and S 310 B be taken in the following summer. In exceptional cases S 305 A, S 310 A, and S 305 B, but not S 310 B may be taken together, by special permission.

A. First term. Credit three hours. Lectures and written reviews. Daily, 8. *Room 207.* Professor JOHNSON.

B. Second term. Credit three hours. Lectures and written reviews. Daily, 9. *Room 302.* Open to those who have had S 305 A. Mr. TALLMAN.

The lectures discuss systematically the more important compounds of carbon, their occurrence, methods of preparation, reactions, relations, and uses.

S 310. Introductory Organic Chemistry.

A. First term. Credit one to three hours. Laboratory practice and oral reviews. Open to those who have had or who are taking S 305 A. Hours to be arranged, in the mornings. Mr. TALLMAN and Mr. VITUM.

B. Second term. Credit one to three hours. Laboratory practice and oral reviews. Open to those who have had S 305 A and S 310 A. Hours to be arranged, in the mornings. Mr. TALLMAN and Mr. VITUM.

The student prepares a number of typical compounds and familiarizes himself with their properties, reactions, and relations.

S 320. Advanced Organic Chemistry. Credit two or more hours. Laboratory practice at hours to be arranged, in the mornings. Professor JOHNSON.

An advanced course in the preparation of organic compounds, involving the use of the more difficult classical methods and of the less common reagents.

S 375. Introductory Organic Chemistry. Shorter Course. Lectures and written reviews. Daily, 8. *Room 207,* throughout the session, and also daily, 9, during the latter part of the session only. Professor JOHNSON.

A shorter course in organic chemistry, designed for students in home-economics, pre-medical, biological, and agricultural curricula. Required of students in certain of these curricula. Credit four hours for lectures and written reviews.

Laboratory practice. Credit one or two hours. Hours to be arranged, in the mornings. Mr. TALLMAN and Mr. VITUM.

Students preparing for the study of medicine should learn the requirements in Organic Chemistry of the medical school which they intend to enter, and if more than six hours of credit are required, should register in Chemistry 305 and 310.

S 405. Introductory Physical Chemistry.

A. Credit three hours. Lectures, daily except S, 8, and two other lectures at hours to be arranged. *Room 7.* Professor BRIGGS. A systematic presentation of modern chemical theory. The subject matter includes: gases, liquids, and solids; chemical equilibrium in homogenous and heterogeneous systems; the phase rule and its applications; the theory of solution; the elements of thermochemistry and thermodynamics.

B. Credit three hours. Lectures, daily except S, 9, and two other lectures at hours to be arranged. *Room 7.* Professor BRIGGS and Mr. CONGDON. A continuation of Part A. The subject matter includes the theory of solution; ionic equilibria; reaction velocity and catalysis; elementary electrochemistry; colloid chemistry; the application of the phase rule to systems of two and three components.

S 410. Physical Chemistry Laboratory. A. Credit three hours. Laboratory practice, daily except S, 8-1. *Room 1.* Professor BRIGGS and Mr. CONGDON. Open only to those who have taken or are taking Course S 405A or its equivalent. With the data obtained in the laboratory as a basis, detailed reports are written

covering each of the following topics: molecular weight determination by vapor density, boiling point and freezing point methods; vapor pressure; viscosity; distillation of liquid mixtures.

B. Credit three hours. Laboratory practice, daily except S, 8-1. Room 1. Professor BRIGGS and Mr. CONGDON. Open only to those who have taken or are taking Course S 405 B or its equivalent. The course is a continuation of Part A. The following topics are considered: dissociation; solubility, reactions; reaction velocity and catalysis; indicators; thermochemistry; diffusion; colloids and adsorption; photochemical reactions; phase rule studies of inversion points; solid-liquid, liquid-liquid, compounds.

S 465. Laboratory Practice in Physical Chemistry. Credit one to three hours. Laboratory periods to be arranged. Professor BRIGGS and Mr. CONGDON.

This course is designed to afford opportunity for special laboratory practice in physical chemistry, colloid chemistry, or electrochemistry.

S 505. Introductory Chemical Spectroscopy. Lectures and laboratory practice. Credit three hours. Lectures, daily except Sat., at hours to be arranged. Room 377. Laboratory practice at hours to be arranged. Room 396. Professor PAPISH and Mr. KETCHAM.

The construction and use in chemical analysis of the spectroscope, polariscope, refractometer, colorimeter, and nephelometer. The laboratory instruction is devoted to training in the use of these instruments in the solving of chemical problems.

S 520. Spectrographic Methods. Credit one or more hours. Laboratory practice at hours to be arranged. Prerequisite course S 505. Room 396. Professor PAPISH and Mr. KETCHAM.

Application of photographic methods to arc, spark, and absorption spectroscopy as aids in chemical analysis.

Students not desiring University credit may arrange to cover different branches of chemical spectroscopy to suit their special needs.

S 530. Introductory Chemical Microscopy. Lectures and laboratory practice. Credit three hours. Lectures, M W F, 10. Room 377. Laboratory, M W F, 11-1, T Th, 10-1; optional, M W, 1:40-4. Room 378. Assistant Professor MASON and Mr. FORGENT.

Microscopes and their accessories, as applied to problems in chemistry and technology. Micrometry; quantitative analytical methods; optical properties of crystals and other doubly refractive materials; physico-chemical studies; illumination, photomicrography, and ultramicroscopy; recognition of textile and paper fibers.

S 535. Advanced Chemical Microscopy. Laboratory practice. Credit three hours. Prerequisite course S 530. Laboratory periods and conference hours to be arranged. Room 378. Assistant Professor MASON and Mr. FORGENT.

Practice in the examination and analysis of inorganic substances containing the more common elements, with special reference to rapid qualitative methods and to the analysis of minute amounts of material.

Students not desiring University credit, who wish to secure a working knowledge of Chemical Microscopy in the shortest possible time, may arrange with the instructor to cover the parts of both of the above courses which best meet their needs.

S 195, S 295, S 395, S 495, S 595. Research. Credit one to six hours. Senior chemists, and others by special permission, may elect research in the fields of Inorganic, Analytical, Organic, or Physical Chemistry, or Chemical Spectroscopy, or Chemical Microscopy, under the direction of some members of the staff of instruction.

DESIGN

S 1. Architectural Design. Maximum credit six hours. White. Professor BURNHAM.

Registration is limited to technical students properly qualified. The course will be withdrawn if too few apply. Consult the instructor.

A continuation of courses in the College of Architecture; major and minor problems in design; the work approximates that of a regular term.

DRAWING: PAINTING: HISTORY OF ART

S1. Elementary Drawing. Credit two hours. Daily except Sat., 2-4. *Franklin.* Mr. WASHBURN.

This course for beginners in drawing embraces freehand perspective, drawing of geometrical objects and simple casts. The course will begin with pencil work and continue with light and shade in charcoal.

S2. Elementary Color. Credit two hours. Daily except Sat., 8-10. *Franklin.* Assistant Professor STONE.

Instruction for beginners in color. Students work in pastel from simple groups of objects. Talks will be given on the theory of color.

S4. Antique. Credit two hours. Daily except Sat., 2-4. *Franklin.* Mr. WASHBURN.

Prerequisite for this course is a knowledge of the elements of drawing. Instruction will be given in charcoal from casts.

S5. Advanced Color. Credit two hours. Daily except Sat., 8-10. *Franklin.* Assistant Professor STONE.

As in elements of color, students in advanced color work from groups (vases, fruit, flowers) in oil or in water color. Those who have not had elements of color may enter this course on submission of examples of original work. Copies of others' work will not be sufficient for entrance.

S6. Outdoor Sketching in Color. Credit two hours. Daily except Sat., 2-4. *Franklin.* Assistant Professor STONE.

A knowledge of the elements of drawing and the elements of color is a prerequisite to this course. Instruction is given in oil from landscape.

The unusual variety and charm of the natural environment of Cornell give an abundance of subject-matter from which to work. There are woodland, open farming country, lakes and streams, broad panoramic views, and rugged gorges within easy walking distance of the campus. The student is therefore inspired by surroundings of unique beauty.

S7. Drawing from the Human Figure. Daily except Sat., 10-12. *Franklin.* Mr. WASHBURN.

Study from living model in charcoal. Courses S1 and S4 or their equivalent are prerequisite to this course. A Studio fee of ten dollars is charged.

NOTE: All materials needed in any of these courses may be obtained in Ithaca.

S15. History of Ancient Art. Credit two hours. Daily except Sat., 10. *White 33.* Assistant Professor FINLAYSON.

A general survey with emphasis on Greek sculpture.

S17. History of Florentine Painting. Credit two hours. Daily except Sat., 11. *White 33.* Assistant Professor FINLAYSON.

A survey of the development of Florentine painting from the fourteenth to the sixteenth century.

ECONOMICS AND SOCIOLOGY

The following courses are designed to meet the needs of three classes of students in the Summer Session: (1) those desiring regular college credit for general economics; (2) students with special interests in economic subjects; (3) students seeking broad preparation for the teaching of economics in the secondary schools. For the first group, Course S1 covers the subject matter usually included under elementary economics. For Cornell students, Course S1 satisfies the economics requirement in the College of Engineering and will also serve in lieu of Course 1 as a prerequisite for admission to various advanced courses in economics. Graduate students wishing to pursue special investigations will be afforded assistance by other members of the Department of Economics of the University who may be in residence in Ithaca during the summer.

S1. Modern Economic Society. Credit four hours. Twice daily except Sat., 11 and 12. *GS 142.* Assistant Professor MONTGOMERY.

A survey of the existing economic order, its more salient and basic characteristics and its operation.

S 5. Current Economic Problems. Credit two hours. Daily except Sat., 8. *GS 264.* Professor HOMAN.

A course designed to afford students who have taken an introductory course in Economics the opportunity to become acquainted in a general way with the more important economic problems of the day—tariff problems, reparations problems, railroad problems, trust problems, labor problems, problems of the farmer, conservation problems, and problems of taxation and public finance.

S 11. Money and Banking. Credit two hours. Daily except Sat., 9. *GS 264.* Professor REED.

A study of the history and the theory of money and banking.

S 13. Corporation and Investment Finance. Credit two hours. Daily except Sat., 11. *GS 264.* Professor REED.

A study of the financial problems of the business corporation from the point of view of the management and of the investor.

S 35. Industrial Combinations. Credit two hours. Daily except Sat., 10. *GS 264.* Professor HOMAN.

A study of the concentration of industrial control, including a survey of the trust movement, trade associations, anti-trust legislation and legal decisions, and the present problem of public regulation of industry and trade.

S 50a. Introduction to Sociology. Credit two hours. Daily except Sat., 9. *GS 142.* Associate Professor CLARK.

This course is designed to orient the student in the social sciences and to develop a sociological frame of reference. It includes a study of the origin, evolution, structure, and activities of society; processes of social interaction; collective behavior; and problems of social control.

S 55. Social Pathology. Credit two hours. Daily except Sat., 10. *GS 142.* Associate Professor CLARK.

A sociological approach to problems of disorganization, including the cultural maladjustments of various groups and the concomitant personal demoralization, as involved in poverty, delinquency, suicide, etc.

EDUCATION

Courses S 1, S 2, S 3, and S 4, will be found especially helpful to college graduates who are preparing for examinations in professional subjects as outlined in the New York State Syllabus and Course of Study for the renewal of the College Graduate Certificate Limited. The State Department of Education will hold an official examination for such candidates at Ithaca on August 17 and 18.

Under certain conditions teachers may waive the state examination by completing an approved course of study in the Summer Session. Information regarding details of such a course may be had by consulting Professor R. H. JORDAN, Goldwin Smith Hall 252, either in person or by letter.

S 1. Educational Psychology. Credit two hours. Daily except Sat., 11. *GS 256.* Professor OGDEN.

A study of the learning process and its application to educational theory and practice; the original nature of man; reflex action and instinct; memory, learning, and reasoning; individual differences, and social co-operation.

S 2. Principles of Education. Credit two hours. Daily except Sat., 8. *GS 245.* Professor RUEDIGER.

A study of education from the sociological standpoint: infancy, heredity, and eugenics; the problem of aim; formal discipline; social and personal objectives; the curriculum; the studies and their functions.

S 3. History of Education. Credit two hours. Lectures, recitations, and prescribed readings. Daily except Sat., 9. *GS 256.* Mr. HULSE.

The purpose of this course is to give an understanding of present educational values and practices through an historical consideration of their origin and development.

The topics treated are to a great extent those emphasized in the syllabus for the New York State Teachers' Certificate; education in primitive and barbaric

societies; the rise of the school as an institution; Greek and Roman education; scholasticism, humanism, and realism; the 'psychological' movement; the origin and nature of specifically modern tendencies in education.

S 4. Secondary School Methods. Credit two hours. Daily except Sat., 10. GS 256. Professor RUEDIGER.

A study of the principles underlying vital instruction in its intellectual, emotional, and motor phases: the use of supplementary devices; the project; motivation; types of subject matter; lesson assignment; questioning; the art of study; supervised study; tests and examinations; lesson planning; class management.

The course is planned to meet the New York State Certificate requirement in general method, and is adapted especially to the needs of younger and relatively less experienced teachers. Teachers of longer experience are referred to Course S 226.

S 5. High School Administration. Credit two hours. Daily except Sat., 12. GS 256. Mr. HULSE.

A study of the principles basic to administration of the senior and junior high school; the course of study; principles of election; classification of pupils; use of intelligence and achievement tests; the principal as supervisor; building problems; selection and rating of teachers; schedule-making; problems growing out of the experience of the class.

S 6. Philosophy of Education. Credit two hours. M W F, 2-3:30. GS 236. Professor OGDEN.

A study of education as interpreted by the more important philosophical conceptions and theories, with special application to the spirit and demands of modern society. Open to graduate students only.

S 7. Mental Measurements. Credit three hours. Lectures, prescribed readings, and laboratory. Daily except Sat., 10. GS 245. Laboratory hours to be determined. Assistant Professor FREEMAN.

The nature of intelligence. The history of the development of individual and group tests of intelligence; principles underlying their formation and application; the use of tests of intelligence in dealing with defective and superior children, and with problem cases; their use in general school problems, and in fields outside the school. The theory, construction, and use of educational tests. Demonstration and practice in administering tests.

S 8. Advanced Mental Measurements. Credit two to three hours. Daily except Sat., 8. GS 236. Laboratory at hours to be determined. Prerequisite Education S 7 or its equivalent. Assistant Professor FREEMAN.

A detailed and critical investigation of some of the chief problems of mental measurements; their theoretical and practical bearings.

S 9. Special Problems in Education. Professor JORDAN will advise students majoring in the Department of Education; students majoring in rural education may consult any member of that Department.

This course is designed to give advanced students an opportunity for study of special problems under personal direction of instructors. The work may consist either of essays and reports on some special topic, or of laboratory practice of an advanced grade. Students interested in work of this nature should consult with some member of the resident staff.

S 10. Problems in School Administration. Credit two hours. T Th, 1:40-4. GS 236. Professor JORDAN.

A study of administration of school systems, together with problems peculiar to the administration of secondary schools. The course follows a four-year cycle of material, especially arranged to give graduate students a continuous four-year course. Students may enroll in any unit of this course, and particular attention is paid to the needs of each group. Open, by permission of the instructor, to graduate students and to teachers of experience. Papers and reports required.

S 11. Extra Classroom Activities. Credit two hours. Daily except Sat., 8. GS 256. Professor JORDAN.

A study of the place extra classroom activities should assume in the school program. General principles involved, with special attention given to athletics, dramatics, publications, school finance, music, debate, and school clubs. Individual problems of the class will have special attention.

S 14. The Junior High School. Credit two hours. Daily except Sat., 12. *GS 221.* Mr. MEYER.

Among the topics considered in this course are: the development of the junior high school idea; the special purposes of the junior high school; types of administrative organization, bases of determining curriculum content and organization; critical analysis of representative curricula and courses of study; special problems of pupil activities, pupil guidance and adjustment.

S 17. The Curriculum of the Junior-Senior High School. Credit two hours. Daily except Sat., 10. *GS 221.* Mr. MEYER.

Special emphasis will be placed upon the curriculum in its relation to the large aims of the secondary school. The complementary nature of the junior and senior high school will receive particular attention.

S 18. School Supervision. Credit two hours. Daily except Sat., 11. *GS 183.* Professor BENTLEY.

The principles and applications of supervision of city and town school systems, involving problems of evaluation and improvement of teaching, and of subject matter. Open to both supervisory officers and teachers. The course will attempt to meet the particular needs of the class.

S 20. Practice in High School Method. Credit one to three hours. Hours to be arranged. *GS 251.* Mr. HULSE.

This course is limited to students needing credit in practice teaching to meet specific state requirements. Application must be made before June 1 to Mr. M. L. Hulse, 251 Goldwin Smith Hall, Ithaca, N. Y. The work will involve daily observation and practice in the Ithaca High School Summer Session under supervision of selected teachers and under the general direction of the Department of Education. Frequent conferences will be held with the instructor in charge.

S 28. Educational and Vocational Guidance. Credit two hours. Daily except Sat., 9. *GS 120.* Professor BENTLEY.

A study of the larger aims and problems of guidance in secondary education; of the present status and trends in the guidance movement; of the guidance agencies and resources and methods of utilizing them; of school organization and curricular adjustments appropriate to the ends of guidance, etc.

S 30. Teachers' Course in Social Studies in Senior High School. Credit two hours. Daily except Sat., 12. *GS 225.* Mr. KIDGER.

This course considers the content and method of teaching social studies in the senior high school. The interrelation of geography, history, and civics will be emphasized. Especial attention will be given to the most effective methods not only in presenting American history but also in dealing with problems of democracy. A consideration of individual method of measurements, and effective methods of testing, the use of outside reading, maps, charts, diagrams, note books.

S 127. Methods of Visual Instruction. Credit two hours. Daily except Sat., 8. *Fernow 8.* Dr. FISHER.

A consideration of the use of visual materials and equipment in schools with suggestions for the preparation of materials for use and a study of sources of supply. Practice will be provided for use of projection apparatus and other equipment.

S 226. Foundations of Method. Credit two hours. Daily except Sat., 10. *GS 183.* Professor MOORE.

This course is designed primarily for experienced elementary and high school teachers and supervisors. It will include a critical examination of current and proposed educational methods in the light of accepted principles of educational psychology.

ADDITIONAL COURSES IN EDUCATION

Attention is called to the announcement of the Department of Rural Education on p. 72. In addition to courses of strictly rural character, a number of courses of general educational nature are open to all students of the Summer Session.

TEACHERS' COURSES IN HIGH-SCHOOL SUBJECTS

The following courses are offered for teachers desiring to study problems of instruction in different high-school subjects. The courses are planned also to meet the requirements of the New York State Department of Education in the issuance of the College Graduate Life Certificate.

TEACHERS' COURSE IN ENGLISH. See English S 5.

TEACHERS' COURSE IN HISTORY. See History S 17.

TEACHERS' COURSE IN SOCIAL SCIENCE. See Education S 30.

TEACHERS' COURSE IN HEALTH EDUCATION. See Health Education S 4.

TEACHERS' COURSE IN LATIN. See Latin S 1.

TEACHERS' COURSE IN MATHEMATICS. See Mathematics S 20.

TEACHERS' COURSE IN MUSIC. See Music S 30, S 32.

TEACHERS' COURSE IN PHYSICS. See Physics S 90.

TEACHERS' COURSE IN SCIENCE. See Rural Education S 126.

TEACHERS' COURSE IN PUBLIC SPEAKING. See Public Speaking S 3, S 31.

TEACHERS' COURSE IN ROMANCE LANGUAGES. See French S 33.

ENGINEERING

The courses in engineering described below are equal in character to corresponding courses given in the College of Engineering during the regular session. They will be accepted for credit towards graduation by the several schools of the college so far as they apply to the prescribed work of the school concerned. Students in the College of Engineering who may desire to offer work done in the Summer Session toward graduation should consult the Director of the school in which they are regularly registered before registering in the Summer Session. Others may obtain information concerning these courses by applying to the Secretary of the College of Engineering.

Additional courses in Structural Engineering and in Hydraulics may be arranged to meet the needs of graduate students.

DRAWING

S 3. **Elementary Engineering Drawing for Secondary Schools.** Drawing Room open daily except Saturday 9-4, daily except Wednesday and Saturday 2-4:30. Hours to suit. *East Sibley 207.* Professor TOWNSEND.

This course is designed for those who wish to teach mechanical drawing in secondary schools and for those who feel the need of a more complete knowledge of this subject to assist them in teaching shop work. Some of the topics covered are use of instruments, lettering, orthographic and isometric projection, inking, tracing, conventions, and working drawings. Students familiar with these topics may elect a more advanced course.

Students must be provided with a set of drawing instruments, an architect's scale, a 30° x 60°, and a 45° triangle.

S 123. **Engineering Drawing.** Hours the same as for S 3. *East Sibley 207.* Professor TOWNSEND.

This course includes such subdivisions as use of instruments, simple projections, free-hand sketching, lettering, conventional signs, working drawings, tracing, blue-printing, etc. The content of this course is equivalent to that of Drawing 123 given during the regular term.

S 125. **Engineering Drawing.** For candidates for the degree of B. Chem. Hours the same as for S 3. *East Sibley 207.* Professor TOWNSEND.

Content of the course the same as S 123 with the substitution of isometric projection and a problem in piping and pipe conventions. The content of this course is the same as Drawing 125 of the regular term.

DESCRIPTIVE GEOMETRY

S. 10. Descriptive Geometry. Lectures, daily except Sat., 9. Recitations and drawing, daily except Sat., 10-12, and 2-5. *Lincoln.* Assistant Professor POND.

A study of the representation of lines, planes, surfaces, and solids, and their interrelations. Warped surfaces, tangencies, intersections, and perspective. The work is the same as that given in the regular C. E. courses 205 and 206; and the student will receive four hours of credit if he takes the whole course. A three-hour course that does not include perspective, and fulfills the requirements of course 124 of the Sibley School of Mechanical Engineering and the School of Electrical Engineering will also be given in both the morning and the afternoon sections. The morning and afternoon sessions make it possible to readjust the schedule so as to accommodate nearly all who may wish to take either course. Those who take course 124 may do their work in the 9-12 period or in the 2-5 period.

KINEMATICS

S 313. Kinematics. Credit three hours. This course is the equivalent of 313 and must be taken with course S 314. Prerequisite courses Physics 6, 330, 311, and 124. Eight recitations a week on the theory of mechanism, instant centers, cams, gears, linkages, velocity and acceleration diagrams. Daily except Sat., 9, and M W F, 12. *East Sibley* 108. Professor ROGERS.

S 314. Kinematic Drawing. Credit two hours. This course is the equivalent of 314 and must be taken with course S 313. Prerequisite courses Physics 6, 330, 311, and 124. Drawing board application of the theory and principles of course S 313 in the construction of cams and gears, the solution of linkage and instant center problems, and the determination of velocity and acceleration diagrams, etc. Any five of the following three-hour drawing periods: T Th, 10-1, M T W Th F, 1:40-4. *East Sibley* 103. Professor ROGERS.

MECHANICS OF ENGINEERING

The following courses in Mechanics of Engineering are open to students from other universities, subject to the same requirements for admission as are made for Cornell students. See the Announcement of the College of Engineering for more detailed description of Courses 220, 221, 223, 330, and 331. Professors GEORGE and CORNELL, Assistant Professor HOWELL. Office, *Lincoln* 33C.

S 220. Mechanics. Credit six hours. Equivalent to C. E. 220. Recitations, daily, 9 and 12; and three computing periods a week.

S 221. Mechanics. Mechanics of Materials. One section. Credit four hours. Equivalent to C. E. 221. Prerequisite course 220 or the equivalent. Recitations, daily except Sat., 8 and 11; and one computing period a week. See S 221 A.

S 221 A. Mechanics Laboratory. Equivalent to C. E. 221 A. Must be taken with S 221. Hours to be arranged.

S 223. Engineering Problems. Credit two hours. Equivalent to C. E. 223. Five computing periods a week. Will be given only if enough students register for the course.

S 330. Mechanics. Credit six hours. One section. Twelve recitations a week and three computing periods. Equivalent to M.E. 330. Recitations, daily, 9 and 12. Computing periods to be arranged.

S 331. Mechanics of Materials. Credit five hours. One section. Eleven recitations and two computing periods a week. Equivalent to M. E. 331. Prerequisite course 220 or 330, or the equivalent. Recitations, daily, 8 and 10. Computations to be arranged.

MATERIALS OF CONSTRUCTION

S 225. Materials of Construction. Credit three hours. The materials studied are: Lime, cement, stone, brick, sand, timber, ores, cast iron, wrought iron, steel, and some of the minor metals and alloys. The chemical and physical properties, uses, methods of manufacture, methods of testing, and unit stresses of each material are considered, particular emphasis being laid on the points of importance to engineers. 9. Professor SCOFIELD.

S 226. Materials Laboratory. Credit three hours. Prerequisite course S 221; and should preferably be taken with or preceded by 280. Experimental determinations of the properties of materials by mechanical tests. Study of testing machines (their theory, construction, and manipulation); calibration of testing machines and apparatus; commercial tests of iron and steel; tensile, compressive, torsional, shearing, and flexure tests of metal and various woods with stress-strain observations; tests of cement, concrete aggregate, concrete plain and reinforced, and of road material and paving brick. The course is planned to supplement Course S 225 with its study of the properties of materials by the actual handling of the materials and by observations of their behavior under stress. Laboratory work, 10:30-12:50. Professor SCOFIELD.

HYDRAULICS

S 240. Hydraulics. Credit four hours. Prerequisite courses 220, 221, or 330, 331. Five recitations and three computing periods a week. Ten demonstration lectures are given in periods to be arranged. Daily except Sat., 10; M W F, 1:40-4. The Schools of Mechanical and Electrical Engineering will accept this course for 334 or 335. Professor SCHODER.

Text: Schoder and Dawson, *Hydraulics*.

Hydrostatics, including stability of gravity dams, immersion and flotation, gas volumes and pressure; flows of liquid through orifices, nozzles, Venturi meters, pipes, and over weirs; time required to fill and empty tanks and canal locks; simple, compound, branching, and looping pipes; elementary power calculations in common pumping and fire protection problems. Flow of water in open channels. Elementary consideration of modern water wheels.

STRUCTURAL ENGINEERING

S 270. Structural Design and Bridge Stresses. Credit four hours. Lectures and recitations, daily except Sat., 8; computations and drawings at hours to be assigned. *Lincoln* 14 and 29. Prerequisite C.E. 220, 221. Assistant Professors BURROWS and O'ROURKE.

One-fourth of the course includes structural details, i. e., the design of a wooden roof truss and other timber joints. The remainder of the course includes dead load, live load, and impact stresses in simple bridge trusses due to uniform live panel loads, locomotive axle loads, and highway loads. Text: Urquhart and O'Rourke, *Stresses in Simple Structures*.

S 271. Structural Design. Credit three hours. Lectures, computations, and drawing. Daily, 10:30-12:50. *Lincoln* 14. Prerequisite C.E. 270. Assistant Professor BURROWS.

An elementary course in steel design. Complete design, detail drawing, bill of material, and estimate of weight of a steel roof truss, a through and a deck-plate, girder bridge. Text: Urquhart and O'Rourke, *Design of Steel Structures*.

S 274. Bridge Design. Credit three hours. Computation and drawing, daily, 10:30-12:50. Prerequisite C.E. 271. Assistant Professor BURROWS.

Computations and drawing for the complete design of a riveted railroad or highway bridge. The computations to determine the sections of all members, joints, splices, and other details are to be written up in systematically arranged reports. The drawing consists of general plans showing the location of all rivets as well as the composition and relation of all members and connections. The final reports are to give a full list of shapes and plates, and a classified analysis of weight for the span.

S 280. Concrete Construction. Credit three hours. Daily, 9-10:30. Prerequisite courses C.E. 220, 221, (see announcement of S 226). Professor URQUHART and Assistant Professor O'ROURKE.

Concrete materials, properties of plain concrete, its making and deposition; elementary theory of reinforced concrete as applied to columns, rectangular beams, and slabs; T-beams reinforced for compression; direct stress combined with flexure. Text: Urquhart and O'Rourke, *Design of Concrete Structures*.

S 281. Foundations. Credit three hours. Daily except Sat., 8. Prerequisite courses 220 and 221. Piles and pile driving, including timber, concrete, tubular, and sheet piles; cofferdams; box and open caissons; pneumatic caissons for bridges and buildings, caisson sinking, and physiological effects of compressed air; pier foundations in open wells; freezing process; hydraulic caissons; ordinary bridge piers; cylinders and pivot piers; bridge abutments; spread footings for building foundations; underpinning buildings; subterranean explorations; unit loads. Text: Jacoby and Davis, *Foundations of Bridges and Buildings*. Recitations, collateral reading in engineering periodicals, and illustrated reports. Professor URQUHART.

S 282. Reinforced Concrete Building Design. Credit three hours. Daily except Sat., 10:30-12:50. Prerequisite C.E. 280. Assistant Professor O'ROURKE.

Design of a reinforced concrete flat-slab building and an investigation of various other types of floor systems for commercial buildings. Complete detail design for one building, including stairways, elevator shafts, penthouses, etc. Working drawings and steel schedules.

S 285. Reinforced Concrete Design. Credit three hours. Daily except Sat., 10:30-12:50. Prerequisite course 280. Professor URQUHART.

Theory and design of gravity, cantilever, and counterfort retaining walls. Design of multiple column footings of reinforced concrete. I-beam grillages. Design of bins and tanks: subsurface and supported on towers. Reports and sketches.

ENGLISH

Courses S 1 and S 2 taken together will be considered the equivalent of either the first term or the second term of Course 1 or of Course 3 in the regular University session, but not of both.

S 1. Composition. Credit two hours. Daily except Sat., 8. *GS 124.* Mr. BALDWIN.

A study of the elementary principles of composition, intended to teach the habit of clear and correct expression; reading of models, frequent writing of themes, class discussions; personal conferences at hours to be appointed.

S 2. Introductory Course in Literature. Credit two hours. Daily except Sat., 9. *GS 124.* Mr. BALDWIN.

A study of selections from Shakespeare, Milton, and writers of lyric poetry, intended to acquaint the student with works of the masters of English literature.

S 4. Advanced Composition. Credit two hours. Daily except Sat., 10. *GS 164.* Dr. MARX.

The planning, writing, and criticism of essays and of other exercises in composition, accompanied by a study of general principles of writing and of questions of English usage. Open only to teachers and to students who have had one year of college English.

S 5. Teachers' Course. Credit two hours. Daily except Sat., 10. *GS 156.* Professor NORTHUP.

Lectures, readings, reports, and discussions. Designed for those who are teaching or who expect to teach English in schools. The organization of the high school course in English; methods of treating the works named by the Conference on Uniform Entrance Requirements in English; the teaching of literature in general; supplementary reading for pupils and teacher; the use of the school library and the public library; stage productions; the place of language and grammar in the high school; problems of oral and written composition; the relation of composition to literature and to other subjects in the curriculum.

S 6. Nineteenth Century Poetry. Credit two hours. Daily except Sat., 12. *GS 156.* Professor SANDERS.

A study of the poetry of Wordsworth and Coleridge, and of their relations to the revolutionary movement and to the new birth of English poetry. Texts: *The Poetical Works of Wordsworth*; *The Poetical Works of Coleridge*, Oxford edition.

A professionalized subject-matter course on teaching regional Geography from the social point of view. The purpose of the course is to emphasize the essentials of the Geography of the regions or countries selected for study; to direct teachers and supervisors to materials; and to outline and demonstrate methods that will help them to interpret geographic relationships in their classes. Special consideration will be given to the content and problems of the Regents Syllabus for Geography in New York State. Lectures, reference readings, and discussions.

S 5. Geology. Credit two hours. Daily except Sat., 10. *Geological Lecture Room.* Assistant Professor SPOCK.

An introductory course in geology, consisting of lectures and assigned readings upon the following topics: origin of the earth; geologic history of the earth; materials of the earth's crust and their arrangement, as well as the forces modifying them; vulcanism, earthquakes, and similar phenomena; development of life on the earth.

The lectures will be illustrated with lantern slides, models, maps, and specimens. Students registering for this course are urged to take the laboratory Course S 9 and, if possible, Course S 10. Credit for Geology course 100 regular session will be allowed only for successful completion of all three courses S 5, S 9, S 10.

S 6. Mineral Resources. Credit two hours. Daily except Sat., 8. *General Geological Laboratory.* Assistant Professor STOW.

A course in which the principal mineral resources both metallic and non-metallic of the United States will be discussed with reference to the following points: distribution, mode of occurrence, uses, relative importance, rank of the United States among nations of the world in production, and the influence of the various deposits upon the development of the regions in which they occur.

An exceptionally complete collection of specimens is available as illustrative material for this course.

S 7. Historical Geology. Credit two hours. Daily except Sat., 11. *General Geological Laboratory.* Assistant Professor SPOCK.

This course deals with the geographic conditions and the animal and plant life of the various subdivisions of geologic time. The development of the groups of the animal and vegetable kingdoms is traced throughout the geologic periods and studies made of fossils both in the collections and on field trips. This course may be taken alone or with either S 1 or S 5. Students taking it are urged to take S 10, as stratigraphic features are pointed out on all the field trips.

LABORATORY AND EXCURSION COURSES IN BOTH GEOGRAPHY AND GEOLOGY

S 8. Physical Geography, Laboratory Course. Credit one hour. T Th, 2-4. *Physical Geography Laboratory.* Miss BAKER.

The members of this class will make a study of the physiographic regions of the United States, using contour maps, models, and the experimental laboratory of the department. By such study topographic, regional, and life relationships (human, animal, and plant) will be correlated. There will be given also exercises on the other physiographic topics generally included in a laboratory study of the subject. The course will prove of worth to teachers of geography in the grades who wish to obtain a broader basis for their work in the subject as well as for those who expect to teach geography in the high schools.

A laboratory fee of \$1 must be paid to the Treasurer at the beginning of the session to cover laboratory maintenance.

S 9. Geology, Laboratory Course. Credit one hour. W F, 2-4. *General Geological Laboratory.* Mr. CONANT.

This course is designed to supplement course S 5. A study will be made of the more common structural phenomena; of the interpretation and uses of geological maps; of characteristic life forms developed in different geological periods; and of the more common rocks and minerals. Short field excursions will be made to collect both rock specimens and fossils.

A laboratory fee of \$1 must be paid to the Treasurer at the beginning of the session to cover laboratory maintenance.

S 10. Geography and Geology, Field Course. This course should be elected by all those registering in Course S 1 or S 5. With courses S 1 and S 8 it affords a comprehensive course in physical geography; with courses S 5 and S 9 it will give a similarly broad training in elementary geology, as the dynamic phases of geology are emphasized on the excursions. Mimeographed outlines of the excursions are to be secured by each student desiring credit. See also a pamphlet, obtainable in Ithaca, on *The Geography and Geology of the Cornell Region*. Assistant Professor STOW, Mr. CONANT, Miss BAKER, Miss DANNER, and other members of the staff.

Those desiring University or entrance credit must take field notes and hand in written reports. Excursions 1, 2, 3, 4, 5, are required of all students in the course, and in addition for one hour's credit they must take, their own choice, two of the three all-day excursions 6, Taughannock, 7, Northern Pennsylvania, and 8, Watkins.

Meeting place and time announced in mimeographed outlines or by bulletin. Meet for first excursion, Monday, July 6 at McGraw Hall, 2 P. M. Excursions 1-5, Monday afternoons; 6, 7, 8, all day Saturday. On the excursions to which a cost is attached persons wishing to go must register at the department and secure tickets in advance of the date of the trip. Announcements regarding field trips are posted on the Middle Door of *McGraw Hall* and all arrangements for reservations and tickets are made in the Geology Department Office, middle entrance, *McGraw Hall*. The trips are open to others besides the members of the excursion class as far as accommodations are available. Students desiring credit or certificates of attendance must register in S 10 and will be given preference in accommodations.

The longer excursions will be in charge of Assistant Professor Stow, with the cooperation and assistance of the other members of the instructing staff. On the excursions stops will be made at points of interest, explanations made, questions asked, and discussion invited.

OUTLINE OF EXCURSIONS: COURSE S 10

Monday Afternoons

1. **Bald Hill.** To become acquainted with the lie of the land about Cornell, to learn the place names of the broader physiographic features, studying enroute processes of weathering, and, at the summit, the maturely dissected plateau. The top of the hill is a vantage point from which a good view of the lake and the land for miles to the north, east, and west may be had. July 6.

2. **Cascadilla Creek.** To study the origin and nature of sedimentary rocks, also processes of erosion, transportation, deposition, and cementation. An intimate view of one of the large gorges and its special features. July 13.

3. **Portland Point.** By auto-bus. To study rock structure; intrusion of igneous rocks into sedimentary formations; rock-folding and small scale faulting and associated phenomena; vein-formation; fossil content of strata; economic utilization for cement; gas wells. July 20.

4. **Enfield Gorge and Falls.** By auto-bus. To study the relations of preglacial and hanging valleys and the postglacial and interglacial gorges, their origin and features. Joint-plane guidance of stream courses. A ride to the head of the gorge, climb through it to the lower end past the crest of Lucifer Falls. Enfield is perhaps the most picturesque and wildest of the gorges in the Cornell region. July 27.

5. **Terminal Moraine.** North Spencer. By auto-bus. To study a massive morainic loop, the basin in which the former ice tongue rested, and the outwash deposits and overflow channels to the south. Truncated valley sides due to glacial erosion. The most striking examples of glacial phenomena in the Cornell region. August 3.

All-day Excursions

6. **Taughannock Gorge and Falls.** By steamer. To study the Inlet Plain, its reclamation, the Barge Canal terminal, the position and succession of the Devonian strata along the lake shore, and the deep gorge and falls of Taughannock, one of the highest straight falls east of the Rockies. Luncheon at the foot of the falls. July 11.

7. **Northern Pennsylvania.** Geology of an anthracite mine and the physiography of the Susquehanna valley at Wyalusing Rocks. Stops will be made to study Appalachian structure, folds and faults, and the stratigraphy of a complete section from the Portage beds of the Devonian through the Pottsville conglomerate of the Pennsylvanian. An exceptionally fine scenic trip by auto-bus over the Roosevelt Highway through southern New York and northern Pennsylvania. July 18.

8. **Watkins Glen.** By auto-bus. Watkins Glen is one of the most beautiful scenic spots in the country. The excursion party will study the gorge, its pot holes, and its falls in detail; and consider its relations to the Seneca Lake valley in comparison with the conditions at Ithaca in relation to the Cayuga valley. Luncheon at the head of the gorge. July 25.

FIELD COURSES IN GEOLOGY AND GEOGRAPHY

S 20. **Geography and Geology of the Adirondacks, the Thousand Islands, Quebec, the St. Lawrence Valley, the Helderberg Mountains.** Credit two hours. August 15–August 28. By auto-bus. Cost, including tuition, \$160 (providing a sufficient number register), of which \$25 must be paid on registration, the remaining \$135 not later than August 1. Undergraduates in Cornell University must secure in advance the Dean's permission to take the course. Professor VON ENGELN and Dr. TRAINER.

Observations will be made and instruction given each day in the field and a recitation and quiz class, with inspection of note-books, will be held each evening. Credit for the course will be given only on the basis of satisfactory work in all phases.

This course is designed for two classes of students: (a) those without special training in Geography or Geology; (b) those who have had university or college courses in these subjects either in the Summer Session of Cornell University or elsewhere.

For those persons who have had no previous training, the course will provide a general introduction to these subjects through field experience under guidance of competent instructors. Thus the course should serve to make later text study of Geology and Geography more significant than it could be without such a background of personal contact with different types of geographic and geologic phenomena. For persons who have already had training in these subjects the purpose is to give an opportunity to refer such general knowledge to specific phenomena and problems encountered on the trip, and to become acquainted with the nature of the evidence available in the field for the elucidation of such problems. Besides, the trip of approximately 2,000 miles will afford participants a broad general acquaintance with a number of very interesting regions having many historical and literary sites and associations, and in particular a contact with the French settlement of Canada, including a day's stay in the fascinating city of Quebec.

The itinerary as planned includes studies of Paleozoic stratigraphy north to the Mohawk valley, the escarpment west of the Adirondacks, Black River falls, power development at Watertown, divide at Little Falls, boat trip through the Thousand Islands, glacial phenomena and marble quarries at Gouverneur, zinc mines, igneous and metamorphic rocks, Adirondack physiography, Mount Whiteface, Lake Placid, Ausable Chasm, Lake Champlain, asbestos mines, St. Lawrence river. Quebec, lower St. Lawrence plain, Rangeley lakes, Franconia Notch, Echo Lake, Profile Mountain (Great Stone Face), Connecticut valley, granite quarries, marble quarries, Green Mountains, graphite mines, Lake George, Glens Falls, Stark's Knob, Saratoga Springs, Cryptozoon ledges, Glacial Lake Albany Plain, Helderberg Mountains, Howe Caverns, Cooperstown, Otsego Lake, headwaters of the Susquehanna.

The fee of \$160 includes tuition, transportation, meals, and lodging. Overnight stops will be made at comfortable hotels; two in a room. In Quebec it is planned to stay at the Chateau Frontenac. For single room or room with bath the extra charges made by the hotels will need to be paid by person ordering. Further details will be found in a special circular to be had on application by mail or in person at the Summer Session office, *Goldwin Smith Hall*.

S 21. Summer Field School in Geology. Intended for students who desire to study geology in the field. The camp is located in central Pennsylvania near Tyrone and instruction covers a period of six weeks, from June 14 to July 25. Six units of college credit are given upon successful completion of the course. Fixed expenses, including the regular tuition fee of \$60.00, are approximately \$150.00. Registration is limited to men. Assistant Professor NEVIN.

The region selected is especially suitable for field work in geology. Sedimentary rocks from Cambrian to the Coal Measures are represented, with a total thickness of some 27,000 feet. Folds and faults are extensively developed, and their effect on the topography is very marked. Instruction includes both reconnaissance and detailed mapping. The course, open to students with either elementary or advanced training in geology, will be conducted to meet the individual needs of the student. A special circular containing detailed information will be furnished upon request.

GERMAN

S 1. First Year German. Oral training, grammar, composition, reading. Daily except Sat., 8 and 12. *GS 183.* Professor POPE. Credit four hours. Entrance credit, one unit.

After successfully completing this course, students can, by supplementary reading during the summer, prepare themselves for the College Board entrance examination in second year German.

S 3. Third Year German. Reading, grammar, composition, oral training. Daily except Sat., 8 and 12. *GS 177.* Professor BOESCHE. Credit four hours. Entrance credit, one unit (third unit).

Prerequisite: two years of high school German or its equivalent.

S 4. Composition and Conversation. Credit two hours. Daily except Sat., 8. *GS 190.* Dr. KUBLER.

Exercises conducted in German. Prerequisite course S 3 or its equivalent.

S 6. Advanced Practical Course in German Grammar. Credit two hours. Daily except Sat., 11. *GS 177.* Professor BOESCHE.

For teachers and advanced students. A presentation of the chief problems of German grammar, such as the auxiliary use of *haben* and *sein*; the use of the subjunctive; moods and tenses in indirect discourse; separable and inseparable verbs; the order of words; the use of cases; etc. Historical explanations of modern conditions will be given but no knowledge of the earlier periods of the German language will be required.

S 7. Deutsche Kulturkunde. Lectures in German, with collateral reading. Daily except Sat., 9. *GS 190.* Dr. KUBLER. Credit two hours.

The lectures will give a survey, with illustrations, of the life, customs, and civilization of Germany, present and past.

S 8. Lyric and Ballad Poetry. Daily except Sat., 10. *GS 177.* Professor POPE. Credit two hours.

The development of German lyric poetry from the Middle High German period to the present. Especial attention is given to literary appreciation of modern lyrics and ballads. Some time will be devoted to a study of German lyrics and ballads in the settings of modern German composers.

German Lectures. Lectures or interpretative readings in German will be given by members of the department on Wednesday evenings at 8 o'clock in *GS 190.*

German Conversation. A special table for conversation in German will be reserved in Prudence Risley Hall in case a sufficient number of applications are received by the Department of German, Goldwin Smith Hall, before July 1.

GOVERNMENT

S 1. American National Government. Credit two hours. Daily except Sat., 9. *GS 245.* Professor CUSHMAN.

Historical development, organization, powers, and practical working of the American National Government.

S 24. American Social Problems and the Constitution. Credit two hours. Daily except Sat., 11. *GS* 245. Professor CUSHMAN.

The nature of the police power of the national and the state governments. The constitutionality of social and economic legislation. Open to qualified juniors and seniors and to graduates.

GREEK

S 1. Introduction to Greek and to the Reading of Homer. This course is intended (a) for graduate students who have had no Greek; (b) for high-school teachers of Latin who have had no direct acquaintance with Greek and are therefore deprived of one of the chief sources of understanding and appreciating the content of the Latin authors they present in class; (c) for students of literature who desire by intensive work during a Summer Session to lay the foundation for a first-hand appreciation of the literary masterpieces of the Greek genius. Beginning with the alphabet, the course will give a thorough grounding in necessary forms, flexions, and syntax, and will proceed to the reading of a portion of the first book of Homer's *Iliad*. Credit two hours. Daily except Sat., 11. *GS* 124. Professor CAPLAN.

S 2. Homer. This course is designed for students who have mastered the elements of Greek and wish to enlarge their knowledge of Homer. Rapid reading in the *Odyssey*. Credit two hours. Daily except Sat., 10. *GS* 124. Professor CAPLAN.

HEALTH EDUCATION

See under Physical and Health Education, page 45.

HISTORY

S 1. The History of Greece (800 to 323 B. C.). Credit two hours. Daily except Sat., 9. *GS* 234. Professor LAISTNER.

This course will (1) trace the rise and decline of the leading city-states of Greece; (2) offer a general survey of their economic and cultural life.

S 2. Seminary in Ancient History. Credit two hours. Daily except Sat., 10. *GS* 234. Professor LAISTNER.

Primarily for students preparing for the M. A. degree. Selected topics of Greek or Roman History will be treated, to meet, as far as possible, the needs of individual students. Consult the instructor before registering.

S 5. Modern European History. Credit two hours. Daily except Sat., 10. *GS* 242. Professor BECKER.

A general survey of the history of Europe from 1600 to 1815.

S 6. The Napoleonic Empire. Credit two hours. Daily except Sat., 11. *GS* 242. Professor BECKER.

A study of European history from 1795 to 1815.

S 7. English History. Credit two hours. Daily except Sat., 8. *GS* 227. Professor MARCHAM.

A survey of English, political, economic, and social life from the earliest times to the present. Primarily for sophomores and juniors.

S 8. Tudor and Early Stuart England. Credit two hours. Daily except Sat., 9. *GS* 221. Professor MARCHAM.

Politics, the Reformation and Renaissance, the economic revolution. Readings in contemporary literature. Primarily for seniors and graduates.

S 10. The United States, 1850-1877. Credit two hours. Daily except Sat., 9. *GS* 290. Professor WHITAKER.

Survey of American History from the Compromise of 1850 through Reconstruction. Lectures, discussions, readings. For undergraduates.

S 11. The Old South, 1783-1860. Credit two hours. Daily except Sat., 11. *GS* 234. Professor WHITAKER.

Social and political development of the South from the Revolution to the Civil War. Lectures and studies of source problems. For upperclassmen and graduates.

S 12. American History, Westward Expansion, 1750-1820. Credit two hours. Daily except Sat., 8. GS 234. Professor BRETZ.

This course deals with the exploration of the trans-Alleghany country, the movement of population into the West, Indian wars and relations with foreign powers on the frontier, territorial acquisitions, land policy, industrial development of typical communities, and in general with the social life of the new communities between the Alleghanies and the Mississippi.

S 13. Seminary in American History. Credit two hours. Daily except Sat., 10. GS 235. Professor BRETZ.

Chiefly for students who are preparing theses for the M. A. degree. Consult the instructor before registering.

S 17. Contemporary History and its teaching in the secondary schools. Credit two hours. Daily except Sat., 10. GS 120. Mr. KIDGER.

The history of Europe since the war: the Peace Treaty; the conferences of the premiers and of the ambassadors; the League of Nations; England; France; Italy; Germany; Austria; Hungary; Czechoslovakia; Yugoslavia; and Poland. Both in method and in content the course will be useful to teachers in secondary schools especially such as teach the courses in world history prescribed by the new syllabus of the University of the State of New York.

S 30. Teachers' Course in Social Studies. See Education, page 29.

LATIN

The object of the Summer Session courses in Latin is twofold:

(a) To provide a series of courses, theoretical and practical, dealing with the professional training and equipment of the high-school Latin teacher who desires a thorough comprehension of the aims and of the technique of the recent developments in classical teaching in the secondary schools;

(b) To offer advanced courses, with direction of graduate work for those who are qualified to enter the Graduate School or to continue their work as candidates for the degree of Master of Arts with Latin as a major or a minor subject.

The attention of all Latin students is directed to the courses in Greek. See page 40.

S 1. The Teaching of Latin in the Secondary School. Lectures, discussions, problems, reports, and conferences. The present status of Latin; objectives in secondary Latin instruction; the Classical Investigation, Part I, General Report; recent professional literature in the field of Latin; standards and means of determining progress, including the validity of various tests as measures of achievement; general principles of content and method in the light of new objectives; classroom equipment, materials of instruction, and books for teachers and pupils. Special emphasis will be given to the problems of teaching and procedure that pertain especially to first year work. Credit two hours. Daily except Sat., 11. GS 120. Mr. THOMPSON.

S 2. The Second Year of the High-School Course in Latin. Lectures, discussions, problems, reports, and conferences. An extensive study of the content of the second year work; intensive study of selections from Caesar's works and episodes of unusual interest and significance; objectives and special methods of presentation; historical and geographical background; the life of Caesar; Roman military affairs; the problem of articulation with the work of the first year; standards and methods of measuring achievement; the importance of the assignment; the place of Latin composition as a means of mastering fundamentals; recent literature, books, and materials of interest to teachers and pupils. Credit two hours. Daily except Sat., 12. GS 124. Mr. THOMPSON.

S 3. Introduction to Graduate Work in Latin. A general survey of the various fields of advanced Latin study with an examination of the methods and problems involved. Among the topics discussed will be: general linguistics and comparative grammar; phonetics; historical grammar and syntax; palaeography, the descent of manuscripts, and textual criticism; epigraphy; Vulgar Latin; rhythm and metrics. Credit two hours. Daily except Sat., 9. GS 128. Professor DURHAM.

THE SUMMER SESSION

S 4. Cicero as Orator. A study of selected portions of the *Brutus*, the *Orator*, and the *De Oratore*, and the application of Cicero's rhetorical principles to some of the orations presented in the third year of the high-school curriculum. Credit two hours. Daily except Sat., 10. GS 128. Professor DURHAM.

S 5. Theses and Informal Study. Direction will be offered in the preparation of theses by students who are candidates for the master's degree, and opportunities will be afforded for informal study in fields not listed in the series of courses given above.

NOTE: Those who wish to begin their candidacy for the degree of Master of Arts are invited to correspond in advance with Professor Durham, and are requested to bring with them at the opening of the Summer Session such credentials of undergraduate work leading to the degree A.B. as will entitle them to admission to the Graduate School.

MATHEMATICS

Each teacher will have a daily office hour for consultation with students. It is urged that this opportunity be utilized by all concerned.

In the following list, courses S 1 to S 5b are the equivalent of courses having the same numbers in the *Announcement of the College of Arts and Sciences* for 1930-31.

Courses S 1, S 2, S 3, are planned for those teachers in the secondary schools who wish to review these subjects. They are equivalent to the advanced entrance requirements of Cornell University and of the College Entrance Examination Board. They presuppose a ready knowledge of elementary and intermediate algebra and of plane geometry. University credit for S 1, S 2, S 3, three hours each.

Students taking S 5a or S 5b are requested to take no other University work during the session without special permission. University credit for S 5a, S 5b, five hours each.

S 1. Solid Geometry. Daily, 10. *White 1.* Professor GILLESPIE. (Office hour, 9, *White 3.*) *White B 1.* Mr. CLARKSON. (Office hour, 9, *White B 4.*)

S 2. Advanced Algebra. Daily, 9. *White 25.* Professor HUTCHINSON. (Office hour, 10, *White 26.*) *White 21.* Mr. LAWRENCE. (Office hour, 10, *White 23.*)

S 3. Trigonometry. Daily, 8. *White 10.* Professor CARVER. (Office hour, 10, *White 12.*) *White 21.* Mr. LAWRENCE. (Office hour, 10, *White 23.*)

S 5a. Analytic Geometry and the Calculus (First term's work). Daily, 8 and 11. *White 5.* Assistant Professor CRAIG. (Office hour, 9, *White 4.*)

S 5b. Analytic Geometry and the Calculus (Second term's work). Daily, 8 and 11. *White 6.* Dr. DYE. (Office hour, 9, *White 8.*) *White 27.* Mr. TORRANCE. (Office hour, 9, *White 29.*) *White 9.* Mr. PARADISO. (Office hour, 9, *White 29.*)

S 20. Teacher's Course. Credit two hours. Daily except Sat., 10. *White 24.* Professor SNYDER. (Office hour, 11, *White 26.*)

The course will comprise selected topics in the subjects of secondary school mathematics, including constructions by ruler and compass and the solution of equations. The mutual dependence of algebra and geometry in the solution of problems will be emphasized.

ADVANCED COURSES

S 24. Theory of Equations. Credit three hours. Daily, 12. *White 6.* Professor HURWITZ. (Office hour, 11, *White 8.*)

An elementary course which will include solutions of the cubic and quartic; the theorems of Sturm and Budan-Fourier; solution of equations with numerical coefficients; determinants and eliminants.

S 41. Elementary Differential Equations. Credit three hours. Daily, 8. *White 28.* Professor SHARPE. (Office hour, 9, *White 29.*)

A first course in ordinary differential equations; knowledge of the calculus is presupposed.

S 42. Advanced Calculus. Credit three hours. Daily, 11. *White 1.* Professor GILLESPIE. (Office hour, 9, *White 3.*)

A study of the processes of the calculus; definitions and properties of limits, continuity, derivatives, and integrals.

S 61. Projective Geometry. Credit three hours. Daily, 9. *White 10.* Professor CARVER. (Office hour, 10, *White 12.*)

The principles underlying projective forms of the first and second degrees will be discussed. Although no knowledge of mathematics beyond plane geometry will be presupposed, additional training is highly desirable.

S 62. Advanced Analytic Geometry. Credit three hours. Daily, 10. *White 28.* Professor SHARPE. (Office hour, 9, *White 29.*)

Homogeneous point-coordinates and line-coordinates will be defined for a plane, and projective properties of plane figures will be studied by means of these coordinate systems.

READING AND RESEARCH COURSES.

In addition to the preceding courses, opportunities are offered to graduate students to participate in informal work by reading and research under the direction of members of the Department of Mathematics. A regularly registered student may, by arrangement, obtain academic credit for any of this work; the number of hours of credit will depend on the amount of work done. Students interested in such directed reading or research may consult any of the following: Professors HUTCHINSON, SNYDER, SHARPE, HURWITZ, CARVER, GILLESPIE; Assistant Professor CRAIG.

S 100. Topics in Algebra.

S 100. Topics in Analysis.

S 100. Topics in Geometry.

S 100. Topics in Applied Mathematics.

MUSIC

S 3A. Dalcroze Eurhythmics. Credit two hours. Daily except Sat., 8. *Room B, Drill Hall.* Miss REUSCHEL.

A course in the expression of music through bodily action, dealing with rhythm, dynamics, mood, and other elements of musical content. This is a beginner's course, intended for students who have not had previous training in the subject. Auditors and visitors will not be allowed. A special fee of ten dollars is charged for this course.

S 3B. Dalcroze Eurhythmics. Credit two hours. Daily except Sat., 9. *Room B, Drill Hall.* Miss REUSCHEL.

A continuation of course S 3A, open to students who have completed that course or its equivalent.

S 10. Harmony. Credit two hours. Daily except Sat., 9. *Music Building, 320 Wait Avenue.* Assistant Professor SMITH.

A course dealing with the construction and interconnection of triads and chords of the seventh.

[S 17. **The Art of Music.** Not offered in 1931.]

S 19 A. History of Pianoforte Literature. Credit two hours. Daily except Sat., 10. *Music Building, 320 Wait Avenue.* Assistant Professor HAIGH.

An illustrated course giving a survey of pianoforte literature from its beginnings through the Beethoven period. Although intended primarily for students who play the piano, technical proficiency on the instrument is not required as a prerequisite.

[S 21. **History of Music.** Not offered in 1931.]

S 30. Music in the Grade Schools. Credit two hours. Daily except Sat., 11. *Music Building, 320 Wait Avenue.* Mr. PERCIVAL.

An introduction to the general problem of school music; its values as an educational subject; principles underlying classroom methods; examination of materials and practical suggestions for teachers of grades 1 to 8.

S 32. Music in the High School. Credit two hours. Daily except Sat., 12. *Music Building, 320 Wait Avenue.* Mr. PERCIVAL.

A study of the needs and problems of the High School with reference to the place of music in that school and to the types of musical instruction suitable to and desirable in that school; evaluation of methods and materials and practical suggestions for teachers.

S 35 A. Voice Culture. Credit two hours. Daily except Sat., 2. *Music Building, 320 Wait Avenue.* Mr. SPOUSE.

A course dealing with the theory and practice of vocal production as applied to speaking and singing, with special attention to methods of presentation to groups rather than to the individual. (This course was offered in the summer of 1930 under the number S 35.)

S 35 B. Voice Culture. Credit two hours. Daily except Sat., 3. *Music Building, 320 Wait Avenue.* Mr. SPOUSE.

A continuation of course S 35 A, open to students who have satisfactorily completed that course or its equivalent.

Individual Instruction in Organ, Piano, and Voice. No credit except for regular students majoring in music. Hours to be arranged. *Music Building, 320 Wait Avenue.*

Individual instruction in organ will be given by Assistant Professor SMITH, in piano by Assistant Professor HAIGH, and in voice by Mr. SPOUSE, at hours to be arranged jointly by the instructor and the student. Organ students are allowed to practice on the four-manual Skinner organ in Sage Chapel; practice facilities are available in the Music Building for piano and voice students. Special fees are charged for this instruction and for practice privileges. Students who are interested may obtain further information from the secretary of the Department of Music.

Chorus. The Department of Music will organize and maintain a choir for the services in Sage Chapel at 11 o'clock each Sunday morning during the Summer Session. Applications for admission to this choir will be received by Assistant Professor SMITH in Sage Chapel on Wednesday July 8 from 3:30 to 5 o'clock, or on Thursday July 9 from 4 to 5 o'clock. The rehearsals will be held on Thursdays at 5 o'clock and on Sundays at 10 o'clock, in the choir-loft in Sage Chapel.

PHILOSOPHY

S 1. Logic. Credit two hours. Daily except Sat., 9. *GS 227.* Assistant Professor SMART.

The general character of the thinking process, its laws of development, and methods of solving problems.

S 2. Ethics. Credit two hours. Daily except Sat., 11. *GS 227.* Professor BROGAN.

After a short study of the development of moral attitudes and beliefs, this course will offer a critical formulation of ethical principles and standards, with a discussion of the method of ethical thinking as applied to a few typical problems of social morality.

S 3. History of Ancient Philosophy. Credit two hours. Daily except Sat. 8. *GS 225.* Assistant Professor AMES.

A survey of the chief Greek and Roman systems of philosophy and their survival in the Christian civilization of the Middle Ages.

S 4. History of Modern Philosophy. Credit two hours. Daily except Sat., 11. *GS 225.* Assistant Professor SMART.

The main currents of modern philosophy with special reference to Descartes, Spinoza, Leibniz, Hume, Kant, Hegel, and contemporary problems.

S 5. Introduction to Aesthetics. Credit two hours. Daily except Sat., 10. *GS 225.* Assistant Professor AMES.

A discussion of the relation between art and life, and of the answers given by philosophers to the problem of beauty.

S 6. Systematic Ethical Theory. Credit two hours. Daily except Sat., 9. GS 225. Professor BROGAN.

This course will give a descriptive and critical survey of some of the main recent ethical theories, with an attempt to formulate both the essentials of an ethical system and also the methods for investigating unsettled problems in ethical theory and practice. Knowledge of the chief ethical classics in the history of philosophy will be assumed. For seniors and graduates; others admitted only by special permission.

PHYSICAL AND HEALTH EDUCATION

The following courses are designed primarily for teachers and supervisors of physical education in public schools, and for students who wish to supplement the preparation they may have received in colleges or professional schools. The courses are also open to other students and to teachers who may wish to take either the theory or practice courses or both, and whose application has been approved by the Chairman of the Summer Session.

S 1. History—How Men Have Lived. Credit two hours. Daily except Sat., 8. GS 134. Professor YOUNG.

An historical survey of the distinguishing characteristics of various peoples as to habits of living and forms of physical activity, and the part these have played in their national development.

S 2. Organization and Administration of Play, Athletics, and Gymnastics. Credit two hours. Daily except Sat. 9. GS 134. Professor YOUNG and Mr. CHAMBERLAIN.

The social and educational values of play, with special emphasis upon the management and supervision of high school athletics, recreation centers, scouting, and camp activities.

S 3. Theory of Physical Education and Methods of Teaching. Credit two hours. Daily except Sat., 11. GS 134. Mr. CHAMBERLAIN.

The object and scope of physical education; the principles and technique involved in its teaching; arrangement, classification, and progression of exercises.

S 4. Physical Measurements and Tests. Credit two hours. Daily except Sat., 10. GS 134. Professor YOUNG and Mr. CHAMBERLAIN.

A survey of work in the field of measurements; tests of physical ability and proficiency as applied to elementary and high schools.

S 7. Physiology of Exercise. Credit one hour. M W F, 12. *Stimson.* Dr. GOULD.

The nature and importance of the processes taking place in the body during muscular exercise; effects of exercise upon the heart and blood vessels; the co-ordination of the circulation and respiration; the after-effects of exercise.

S 8. Kinesiology and Corrective Exercises. Credit two hours. Daily except Sat., 11. *Stimson.* Dr. GOULD.

This course deals with the principles and mechanisms of bodily movements. The mechanism of representative types of exercise is studied for the purpose of determining as far as possible their effect upon health. Exercises for the correction of functional bodily deformities are studied.

S 9. Human Anatomy. Credit three hours. Daily except Sat., 8-10. *Stimson.* Dr. GOULD.

A course in the gross anatomy of the body presenting a general knowledge of the relations of the bones, muscles, nerves, and blood vessels. The viscera of the body will be considered in connection with the systems of which they are a part.

The course will consist of lectures and demonstrations with the dissected cadaver, anatomical charts, models, and museum preparations.

S 11. High School Athletics (Men). Daily except Sat., 2-4. GS 134. Mr. CHAMBERLAIN.

The high school attitude toward athletics as a part of the school curriculum; the present day tendencies in the various states; with emphasis upon methods of handling high school boys and upon training for leadership. The second hour will

be devoted to practical work in the fundamentals of football and basketball, with tactics of offense and defense. The course is intended primarily not to train for professional coaching, but to supply information, material, and practice to those who may be called upon to coach in connection with their other teaching.

S 12. Swedish and Danish Gymnastics, with tactics. (Women.) Daily except Sat. 12. *Sage Gymnasium*. Miss BATEMAN.

S 13. High School and College Athletics (Women). Daily except Sat., 5. *Women's Athletic Field*. Miss BATEMAN.

Practical coaching in track and archery. Instruction will also be given in hockey and in basketball if the registration is sufficient.

S 14. Folk Dancing. Daily except Sat., 3. *Sage Gymnasium*. Miss BATEMAN.

S 15. Dancing. Daily except Sat., 4. *Sage Gymnasium*. Miss BATEMAN. Aesthetic and interpretative dancing and technique.

S 16. Swimming. For women. *Sage Gymnasium*, 9-12 A. M., 2:30-5 P. M. Miss RYAN.

Instruction in swimming and life saving for individual training and for teaching will be given at hours to be arranged with each applicant by appointment. For this instruction a special charge of ten dollars is made.

S 18. Tennis. For men and women. 9-12:30, 2-5. *Risley and Sage Courts*. Mr. MURRAY and Mr. MYERS.

Instruction in the fundamentals of tennis, either individually or by pairs. For a series of ten lessons a special charge of ten dollars is made.

S 19. Fencing. For men or women. 9-12:30, 2-5. *Drill Hall*. Mr. DARRIEU-LAT.

Instruction in the fundamentals of fencing, either individually or by pairs, for those who desire teaching experience. For a series of eighteen lessons, three each week, a special charge of ten dollars is made.

HEALTH EDUCATION

These four courses, though they may be taken separately by teachers or nurses having special ends in view, are as a group adapted to the needs of teachers or nurses having special health responsibilities in the school program, for example as health counselors in secondary schools or as supervisors in elementary schools.

S 1. Hygiene of the School Child and Adolescent. Credit two hours. Daily except Sat., 8. *Stimson*. Dr. SMILEY.

In this course an attempt is made to present the principles of personal hygiene as they apply to the child or adolescent in his school life.

S 2. Health Supervision of School Children. Credit two hours. Daily except Sat., 10. *Stimson*. Dr. EVANS.

A practical course of lectures and demonstrations designed to familiarize the student with the school medical inspection and the interpretation of its results, with the methods for the control of communicable disease in the school, with the principles of First Aid, and with the supervision of the physically handicapped pupil.

S 3. Mental Hygiene and the School Child. Credit one hour. M W F, 11. *Stimson*. Dr. EVANS.

An approach to the problems of nervousness and emotional instability in the school child.

S 4. Methods and Materials in Health Education. Credit two hours. Daily except Sat., 9. *Stimson*. Dr. SMILEY.

A discussion of health education through the organization of the school health program, through health habit-formation and through classroom instruction in personal and community hygiene.

The following subjects, which are required for the New York State Teacher's Certificate in Physical Education, and for which regular University credit is given, are offered in the Summer Session: Education, English, Foreign Language, Chemistry, Physiology, History, Biology, Psychology, Educational Psychology, Zoology, Economics.

PHYSICS

Demonstration Lectures. A series of experimental demonstrations covering the entire field of physics. Little time will be spent on the development of the related theory, this being left for the classroom work of courses S 3 and S 4, of which these lectures are a part. Teachers may find in these demonstrations valuable suggestions for their own work.

Daily, 8. *Rockefeller* A. Assistant Professors HOWE and COLLINS.

S 3. Introductory Experimental Physics. Credit three hours. Demonstration lectures, recitations, and laboratory work covering mechanics, sound, and light.

Lectures, M T W, 8. *Rockefeller* A. Recitations, M T W, 9. Assistant Professor HOWE. Written quiz, W, as arranged. Laboratory, two two-hour periods a week, Th F, 8-10, 10-12, 2-4. *Rockefeller* 220. Mr. ZELLER and Mr. ———. Fee, \$5.

Register for this course in *Rockefeller* 220.

S 4. Introductory Experimental Physics. Credit three hours. Demonstration lectures, recitations, and laboratory work covering electricity and heat.

Lectures, Th F S, 8. *Rockefeller* A. Recitations, Th F S, 9. Assistant Professor COLLINS. Written quiz, S, 10. Laboratory, two two-hour periods a week, T W, 8-10, 10-12, 2-4. *Rockefeller* 220. Mr. ZELLER and Mr. ———. Fee, \$5.

This course must be accompanied by course S 3 or preceded by a study of mechanics in either high school or college physics.

Register for this course in *Rockefeller* 220.

Teachers of secondary school physics may, with the approval of the professors concerned, substitute the work of Course S 90 for the recitations of Courses S 3 and S 4.

S 8. Introductory Physics. Credit three hours. Mechanics and heat. This course is the substantial equivalent of course 8 given in the regular session and required of freshman engineering students. It consists of the first half of course S 3 and the last half of course S 4. Laboratory fee, \$5.

Register for this course in *Rockefeller* 220.

S 9. Introductory Physics. Credit three hours. Electricity, sound, and light. This course is the substantial equivalent of course 9 given in the regular session and required of freshman engineering students. It consists of the first half of course S 4 and the last half of course S 3. Laboratory fee, \$5.

This course must be accompanied by course S 8 or preceded by a study of mechanics in either high school or college physics.

Register for this course in *Rockefeller* 220.

S 29. General Physics. Credit two hours. Theory and problems covering selected topics in magnetism and electricity. It is recommended that Physics S 34 be taken simultaneously with Physics S 29. Prerequisite Physics 6, or its equivalent, and calculus. Recitations, daily except Sat., 11. *Rockefeller* 106. Assistant Professor COLLINS.

S 34. Physical Measurements. Credit two hours. Three three-hour laboratory periods a week. Prerequisite Physics 6 and Mathematics 5a and 5b. Physical measurements in properties of matter, mechanics, heat, light, magnetism, and electricity. Required of candidates for M.E. and E.E. Laboratory open daily except Sat., 1:40-4. *Rockefeller* 252. Assistant Professor GRANTHAM. Fee, \$5.

S 60. Physical Experiments. Credit one to three hours. Prerequisite Physics 3 and 4, or Physics 6 and Mathematics 3. Laboratory work in mechanics, properties of matter, heat, sound, light, electricity. Physical principles will be emphasized for students of less experience, while for those of more experience either in physics or mathematics opportunity will be given to study methods of measurements, sources of error, the adjustment and use of instruments of precision, and graphical methods of interpreting results. The instruction is individual and will be adjusted to meet the needs of each student. Laboratory open daily except Sat., 1:40-4. *Rockefeller* 252. Professor GIBBS. Fee, \$2.50 a credit hour.

S 90. Teachers' Course. Credit two hours. Lectures, discussions, and conferences, with emphasis upon the selection, organization, and presentation of subject-matter and practice in the care and manipulation of apparatus in classroom and laboratory. Daily except Sat., 9. *Rockefeller* 108. Mr. ZELLER.

Conferences, individual or by groups, may be arranged for the discussion of practical problems suggested by members of the class. Teachers are advised to bring with them a copy of the textbook which they are using.

Teachers of secondary school physics may, with the approval of the professors concerned, combine this course with Courses S 3 and S 4, which see.

S 106. Advanced Laboratory Practice. Open to students who have had Physics S 60 or its equivalent. Credit varies with the amount of work done. The laboratory is open daily except Sat., 9-12. *Rockefeller* 301. Professor GIBBS and Mr. _____.

Fee, \$2.50 a credit hour.

In this course each student will work independently on a group of experiments selected to meet his own needs and interests. Apparatus and equipment are available for work in a variety of fields, including such experiments as the measurement of the ionization potentials of vapors, the charge and ratio of charge to mass of the electron, the study of photoelectric and thermionic emission, high vacuum technique, the characteristics of vacuum tubes, resonance of high frequency currents, emission and absorption spectra of x-rays, crystal structure by x-ray methods, the Raman effect, spectral terms and series, spectra from atoms in various stages of ionization and methods of their excitation, and solar spectra; the use of spectral filters, the interferometer, the impedance bridge, and the frequency bridge. From the general equipment of the laboratory a student will also find it possible, if he wishes, to devise and assemble apparatus with which he may repeat other experiments or perform new experiments suggested by himself or the instructor.

[The sequence of courses S 111 to S 140 is intended to run through three summer sessions. The schedule for the next three summers is: 1931, S 121 and S 112; 1932, S 122 and S 140; 1933, S 130 and S 111. The courses are of the same general character as the corresponding courses given in the fall and spring terms but include somewhat fewer topics. The selection of these topics will be influenced by the interests and needs of the class. To profit by these courses a student should have a knowledge of calculus and should have completed courses in general physics covering the principal topics of the subject. A student who contemplates electing any of these courses is advised to correspond with the department about his preparation for the work. These courses, as also S 106, S 400, S 415, and S 500, may be taken for credit toward an advanced degree in Physics, subject to the requirements of the graduate school. See the *Announcement of the Graduate School*.]

[S 111. Mechanics. Credit two hours. An introductory study of analytical mechanics and terrestrial and universal gravitation based upon Jean's *Theoretical Mechanics*.] Not given in 1931.

S 112. Properties of Matter. The analysis of stresses and strains and some applications; surface tension; the motion of fluids and the effects of viscosity. Daily except Sat., 8. *Rockefeller* 104. Professor GIBBS.

S 121. Electricity and Magnetism. Electrostatic and magnetic fields, direct current phenomena; gaseous, electrolytic, and metallic conduction; chemical and thermal electromotive forces. Daily except Sat., 9. *Rockefeller* 107. Assistant Professor GRANTHAM.

[S 122. Electricity and Magnetism. Electromagnetism, variable current phenomena, and electric oscillations. Starling's *Electricity and Magnetism* will be used as a text.] Not given in 1931.

[S 130. Light. Geometrical optics; thick lenses; optical instruments. Physical optics: interference, diffraction, polarization. Houston's *Treatise on Light* will be used as a text.] Not given in 1931.

[S 140. Heat. A general discussion based upon Poynting and Thompson's *A Text-Book of Physics*. Heat, with particular attention to the application of the kinetic theory and thermodynamics.] Not given in 1931.

S 400. Radioactivity and the Nucleus. Credit two hours. Prerequisite a thorough general course in Physics and Calculus. Daily except Sat., 12. *Rockefeller C.* Dr. ELLIS.

This course is an account of the present status of radioactivity and of the problem of the structure of the nucleus. No previous knowledge of radioactivity will be assumed. The treatment will not be exhaustive but will be such as to supply the knowledge necessary to appreciate the recent developments in nuclear theories. The disintegration and the emission of α -, β -, and γ -rays will be dealt with in detail.

S 415. Special Topics for Investigation. Students who are prepared to profit by the use of the library and laboratory facilities of the department in the study of some special topic or in investigation will be given an opportunity to do so. This work may be taken in connection with or independently of any of the above courses and will be under the direction of one or more members of the staff, with whom frequent conferences should be arranged. Credit varies with the nature and amount of work done.

For further information regarding opportunities for research and investigation during the summer see the *Announcement of the Graduate School*.

S 500. Selected Topics. Two or three meetings each week at hours to be arranged. Dr. ELLIS.

A discussion course on topics such as the mechanism of emission of α -rays, the β -ray type of disintegration, the origin of the γ -rays and nuclear level systems, interchange of energy between the nucleus and electronic system, recent theories of nuclear structure, and artificial disintegration. The selection of topics will be determined after consultation with the members of the class.

Seminary. Reports and discussions of recent work in Physics. M, 2:30, *Rockefeller C.*

PHYSIOLOGY AND BIOCHEMISTRY

BEHAVIOR

The experimental study of behavior has become an important division of modern biology. It is, moreover, a field of study which is intimately related to the sciences of psychology, education, sociology, and medicine. The courses described below serve a double purpose. In the first place, a general biological introduction to the study of behavior and a review of current theories give the necessary orientation for experimental work for those students not primarily interested in biological science. This purpose is served by courses S 1 and S 2. For those who have completed either or both of these courses and who wish to undertake an experimental investigation, course S 3 provides regular summer session credit for research.

S 1. The Biological Basis of Behavior. Credit two hours. Daily except Sat., 12. *Stimson Amphitheatre.* Professor LIDDELL.

A resumé of the structural and functional arrangements upon which behavior depends will be followed by a critical analysis of current theories.

S 2. The Conditioned Reflex. Credit two hours. Daily except Sat., 2. *Stimson Amphitheatre.* Professor LIDDELL.

A systematic investigation of the facts upon which the theory of the conditioned reflex is based. Laboratory demonstrations and moving pictures will aid in giving a clear conception of the factual material. The theory itself will be carefully examined, with emphasis on its applications in psychology, medicine, and education.

S 3. Advanced Work and Research in Behavior. Hours and credit to be arranged. Professor LIDDELL.

Opportunities for experimental investigation of behavior will be available to properly qualified students. Detailed study of the experimental literature may also be pursued for credit.

PSYCHOLOGY

S 1. Psychology. Credit two hours. Lectures and recitations, daily except Sat., 9. *GS C.* Professor WELD and Dr. FELDMAN.

This course furnishes a general introduction to the psychological study of man from the experimental point of view. It opens with a brief discussion of the nature of psychology, of the problems which psychology is called upon to face, and of the methods at its disposal for their solution. It then sets forth in order the facts and laws of psychological function. Throughout the work use will be made of the unique collection of demonstrational apparatus which composes the equipment of a special laboratory in Goldwin Smith Hall.

Textbook: Bentley, *The Field of Psychology*.

S 2. Attention. Credit two hours. Daily except Sat., 10. *GS C.* Assistant Professor JENKINS.

In this course the application of attention to advertising, to hypnosis, to testimony, to efficiency, and to learning, will receive special emphasis. The application will, however, be made only after the student has been grounded in the elementary facts and laws of attention. The development, the conditions, the kinds, and the levels of attention will first be considered; then the experimental investigations will be reviewed; and thereafter the practical considerations will be taken up.

Demonstrations and class-experiments will be used frequently for illustration. No textbook will be prescribed, but the lectures will be supplemented by assigned readings in standard works.

S 3. How to Study. Credit two hours. Daily except Sat., 8. *GS C.* Assistant Professor JENKINS.

The facts and principles of experimental psychology applied to the problem of efficiency in study. Securing effective surroundings; using one's psychological resources; discovering motives for study.

Demonstrations and class-experiments will be made throughout the course. Readings will be assigned in standard texts and monographs to be found in the library.

S 6. Psychology and its Neighbors. Credit two hours. Lectures and recitations, daily except Sat., 10. *Morrill 42.* Professor BENTLEY and Dr. FELDMAN.

The place of man in the universe and among other animals. Origin and history of man and of human society. The study of living beings by the zoologist, the physiologist, the anthropologist, and the psychologist. The psychologist's way of describing human beings. The psychological functions. The development and socialization of the human infant.

Textbook: Bentley, *Man*.

S 7. Varieties and Schools of Psychology. Credit two hours. Lectures and recitations, daily except Sat., 11. *Morrill 41.* Professor BENTLEY.

An exposition of the current schools of psychology. The historical derivation of present doctrines and points of view. The significance of Behaviorism, Psychoanalysis, Configurationism, Reflexology, and other recent proposals. Fundamental knowledge of psychology will greatly aid the student in this course.

S 8. General Psychology: Problems and Points of View. Credit two hours. Lectures and recitations, daily except Sat., 11. *GS C.* Professor WELD.

This course presupposes S 1 or its equivalent. It presents a survey of the problems and points of view in the entire field of scientific psychology. Beginning with an investigation of typical conceptions of general psychology, the course leads on to the psychology of individual differences, the psychology of the abnormal, animal psychology, psychological development in the race and in the individual, social psychology, and the psycho-technologies.

Textbook: Weld, *Psychology as Science*.

S 9. Graduate Seminary. Daily, by appointment. *Psychological Laboratory, Morrill Hall.* Professor BENTLEY.

Individual researches and informal study.

PUBLIC SPEAKING

ORAL ENGLISH: SPEECH TRAINING: DRAMATIC ART

All summer courses are planned to meet the special needs of teachers. Either S 3 or S 31 (not both) may be counted as a course in methods approved by the New York State Department of Education for the teachers' certificate.

Students should register with the individual instructors, who will be in their offices on registration day and on the first day of instruction. For further details about registration consult Mr. MUCHMORE, GS 27.

For information about advanced work in Speech Training and Phonetics consult Mr. THOMAS, GS 23; in Rhetoric and Public Speaking, Mr. WICHELS, GS 25; in Dramatic Production, Mr. STANTON, GS 33.

S 1. Public Speaking. Credit two hours. Daily except Sat., 11. GS 21. Assistant Professor WAGNER.

A practical training for speaking in public. Study of delivery, of methods of preparation, and of rhetorical forms, with practice in delivery. High-school teachers will find the methods applicable to their work in public speaking and oral English. Regular students passing S 1 are admitted to Public Speaking 2.

S 2. Persuasive Speaking. Credit two hours. Daily except Sat., 9. GS 236. Assistant Professor WAGNER.

Practical training in the composition and delivery of speeches, with special reference to the problems of argumentation and persuasion. Prerequisite Public Speaking S 1 or its equivalent.

S 3. Teachers' Course in Oral English and Public Speaking. Credit two hours. Daily except Sat., 11. GS 236. Assistant Professor MUCHMORE.

For secondary school teachers of English and public speaking. Aims, problems, standards, and methods in oral English, public speaking, and speech training.

[S 8. **Voice Training.** Credit one hour. Daily except Sat., 9. GS 21. Assistant Professor THOMAS.] Not given in 1931.

An elementary course for the improvement of the speaking voice, including instruction in the fundamental principles of voice and speech.

S 10. Oral Interpretation of Literature. Credit two hours. Two sections: daily except Sat., 10, GS 236, Assistant Professor MUCHMORE; daily except Sat., 12, GS 236. Assistant Professor WICHELS.

Principles of reading, and oral interpretation of literature.

S 21. Rhetorical Theory. Credit two hours. Daily except Sat., 12. GS 26. Assistant Professor WAGNER.

For graduates and upperclassmen. Lectures, readings, reports, and discussions.

A study of classical works on the art of public speaking, with illustrations from the orators.

S 30. Teachers' Course in Speech Training. Credit two hours. Daily except Sat., 9. GS 26. Assistant Professor THOMAS.

For secondary and elementary school teachers. A study of English phonetics and pronunciation; of voice-training and the improvement of speech.

S 31. Advanced Phonetics and Speech Training. Credit two hours. Daily except Sat. 11. GS 26. Prerequisite Public Speaking 30 or the equivalent. Assistant Professor THOMAS.

A study of voice training and phonetics, and of methods of improving normal and defective speech.

S 41. Dramatic Production. Credit two hours. Daily except Sat., 11. GS B. Assistant Professor HERRICK and Mr. DUNHAM.

Theory of stage direction; choice of plays; practical phases of production; one-act plays rehearsed; practice with the Summer Theatre. Students in S 41 should take S 10 or offer its equivalent.

S 45. Stagecraft. Credit two hours. Daily except Sat., 10, with additional laboratory hours to be arranged. Stage laboratory. *Morse Hall*. Assistant Professor STANTON and Mr. DUNHAM.

An elementary course in stage theory and practice; the planning of small theatres; design and construction of scenery; lighting; with attention to other contributory crafts and to the related principles of stage direction. Laboratory fee, \$5.

S 60. Seminary in Rhetorical Theory. Hours to be arranged. First meeting July 6, 2 P.M., *GS 25*. Assistant Professor WICHELNS.

For graduates. The topic in 1931 will be the Field of Rhetoric.

S 63. Principles of Voice Training and Speech Correction. Credit two hours. Hours to be arranged. Assistant Professor THOMAS.

For graduates and other students having sufficient preparation for independent work. Readings in the sciences underlying voice-training and speech-correction, with a critical survey of theories and methods.

S 66. Seminary in Dramatic Art. Credit two hours. T Th, 2-4, and an additional hour to be arranged. *GS 21*. Assistant Professor HERRICK.

For graduates prepared for advanced work in the theory of dramatic production. Readings, reports, and lectures.

S 90. Theatre Practice. No credit; a certificate of attendance will be given for satisfactory completion of the routine. Hours to be arranged. Assistant Professor STANTON, assisted by the Summer Theatre Staff.

Open to undergraduates and graduates who are taking or have taken one or more of the courses in Dramatic Production, and to other qualified persons by consent of the instructor. Practical stage management in the Summer Theatre supplementing the work of the courses in Dramatic Production. Registration will be taken in the several classes in Dramatic Production during the first week of the session.

The Summer Theatre. Under the direction of Professor DRUMMOND. Acting Director in the summer of 1931, Assistant Professor STANTON, assisted by Mr. D'ANGELO, Miss WOMAN, Mr. VOSS, and Mr. HERRICK.

During the Summer Session weekly performances will be given by the student repertory Summer Theatre Company. Qualified members of the courses in Dramatic Production may compete for places in the casts of Summer Theatre plays. For this work they will register in the regular classes in Dramatic Production during the second week of the session.

Speech Clinic. For students working under the supervision of the Department of Public Speaking. By appointment. *GS 23*. Assistant Professor THOMAS.

ROMANCE LANGUAGES

FRENCH

S 1. Elementary Course. Credit four hours. Daily except Sat., 8 and 12. *GS 290*. Mr. CHOQUETTE. Entrance credit, one unit.

The object of this course is twofold: first, to give beginners a thorough drill in the essentials of French pronunciation, grammar, and reading; second, to offer to teachers an opportunity of studying the methods of presentation of these subjects to beginners.

S 2. Intermediate Course. Credit four hours. Daily except Sat., 8 and 12. *GS 283*. Mr. WOOLSEY.

Entrance credit, one unit. Prerequisite course S 1 or its equivalent.

S 3. Advanced Course. Credit four hours. Daily except Sat., 8 and 12. *GS 242*. Assistant Professor BISHOP.

Entrance credit, one unit. Prerequisite course S 2 or its equivalent.

S 4. Advanced Translation. Credit two hours. Daily except Sat., 9. *GS 164*. Prerequisite course S 3 or its equivalent. Assistant Professor BISHOP.

S 5. Elementary Composition and Conversation. Credit two hours. Daily except Sat., 11. *GS 290*. Prerequisite course S 3 or its equivalent. Mr. WOOLSEY.

S 9. Advanced Composition and Conversation. Credit two hours. Daily except Sat., 9. *GS 283*. Professor GUERLAC.

Rapid translation from standard English texts into French; frequent theme-writing. This course is conducted in French.

[S 23. **Introduction to French Philology.** Credit two hours. Daily except Sat., 10. *GS* 290. Professor PUMPELLY.] Not given in 1931.

[S 24. **Voltaire and His Time.** Credit two hours. Daily except Sat., 10. *GS* 277. Professor GUERLAC.] Not given in 1931.

Lectures, readings, and reports. Mainly for graduates.

S 27. **Contemporary French Drama.** Credit two hours. Daily except Sat., 10. *GS* 277. Professor MASON.

Lectures and discussions of special topics, with extensive outside reading and reports.

[S 31. **Phonetics.** Credit two hours. Daily except Sat., 9. *GS* 283. Professor MASON.] Not given in 1931.

Lectures on the basic phonetic laws of French and English; practical exercises in phonetic transcription. This course is especially for teachers of French but is open to all students who wish to study the pronunciation of French.

S 33. **Methods of Teaching French.** Credit two hours. Daily except Sat., 9. *GS* 177. Professor MASON and Mr. CHOQUETTE.

Lectures and practical exercises on the following subjects: new-type tests, prognostic tests, achievement tests, silent reading, free composition, Dalton plan, etc. For those desiring to prepare for the written examination for the approval of oral credit of the New York State Department of Education there will be special exercises and individual conferences.

S 35. **France of Today.** Credit two hours. Daily except Sat., 11. *GS* 277. Professor GUERLAC.

Lectures in French on the social, intellectual, and political life of the present.

S 47. **French Seminary.** Credit two hours. M W F, 9. *French Seminary Room, Library.* Professor MASON.

Discussion of special topics in the field of modern French literature. This course is especially for graduate students and candidates for the degree of Master of Arts.

French Lectures. A series of lectures in French dealing with French national life will be given by the members of the instructing staff on Wednesday evenings at 8 o'clock in *Goldwin Smith Hall*, Room 290.

French Conversation. In *Prudence Risley Hall* special tables are arranged under competent supervision for conversation in French.

SPANISH

S 1. **Course for Beginners.** Credit four hours. Daily except Sat., 8 and 12. *GS* 277. Mr. FLORES.

Entrance credit, one unit.

S 4. **Advanced Translation.** Credit two hours. Daily except Sat., 9. *GS* 277. Professor DALE.

S 5. **Composition and Conversation.** Credit two hours. Daily except Sat., 11. *GS* 281. Mr. FLORES.

Special attention will be given to free composition. The course is conducted in Spanish.

Courses S 4 and S 5 taken together have an entrance credit value of one unit.

S 10. **Spanish Literature.** Credit two hours. Daily except Sat., 10. *GS* 281. Professor DALE.

Masterpieces of Spanish. Lectures, readings, classroom discussions.

[S 11. **The Spanish Language.** Credit two hours. Daily except Sat., 10. *GS* 281. Professor DALE.]

A study of the historical development of the language; philology; phonetics.] Not given in 1931.

S 30. **Spanish Seminary.** Credit two hours. M W F, 11. *Romance Seminary Room, Library.* Professor DALE.

Discussion of special topics in the field of Spanish literature. Thesis subjects and related material for graduate students.

SUMMER SESSION OF THE LAW SCHOOL

Eleven Weeks, divided into two terms

COURSES

First term, June 22 to July 29

Contracts. Professor McCURDY, Harvard Law School. Eight hours a week, both terms. Credit six hours.

Property 1a. Professor FARNHAM, Cornell Law School. Six hours a week, both terms. Credit four hours.

Bills and Notes. Professor WHITESIDE, Cornell Law School. Eight hours a week. Credit three hours.

Corporations. Professor DODD, Harvard Law School. Eight hours a week. Credit three hours.

Quasi-Contract. Professor LAUBE, Cornell Law School. Six hours a week. Credit two hours.

Suretyship. Dean ARANT, Ohio State University Law School. Six hours a week. Credit two hours.

Bankruptcy. Professor BRITTON, University of Illinois Law School. Six hours a week. Credit two hours.

Second term, July 30 to September 4

Contracts. Continuation of the course given in the first term.

Property 1a. Continuation of the course given in the first term.

Conflict of Laws. Professor ROBINSON, Cornell Law School. Eight hours a week. Credit three hours.

Public Service. Professor UPDEGRAFF, University of Iowa Law School. Eight hours a week. Credit three hours.

Taxation. Professor ROTTSCHAEFFER, University of Minnesota Law School. Six hours a week. Credit two hours.

Wills. Professor PAGE, University of Wisconsin Law School. Six hours a week. Credit two hours.

Municipal Corporations. Professor MACDONALD, Cornell Law School. Six hours a week. Credit two hours.

Contracts and Property are required of students who begin the study of law in Summer Session.

SUMMER SCHOOL OF BIOLOGY

Under the auspices of the New York State Summer Session at Cornell University and the Summer Session of Cornell University.

The tuition fee in the Summer School of Biology, regardless of the number of courses taken, is sixty dollars.

STAFF OF INSTRUCTION

HOWARD BERNHARDT ADELMANN, Ph.D.	Histology and Embryology (Assistant Professor of Histology and Embryology)
ARTHUR JOHNSON EAMES, Ph.D.	Plant Anatomy and Morphology (Professor of Botany)
HARRY MORTON FITZPATRICK, Ph.D.	Mycology (Professor of Mycology)
ALLAN CAMERON FRASER, Ph.D.	Plant Breeding and Genetics (Assistant Professor of Plant Breeding)
WILLIAM ARTHUR HAGAN, D.V.M.	Pathology and Bacteriology (Professor of Pathology and Bacteriology)
WILLIAM JOHN HAMILTON, JR., Ph.D.	Zoology (Instructor in Zoology)
GEMMA JACKSON, Ph.D.	Botany (Instructor in Botany)
OSKAR AUGUSTUS JOHANNSEN, Ph.D.	Entomology (Professor of Entomology)
BENJAMIN FREEMAN KINGSBURY, Ph.D., M.D.	Histology and Embryology (Professor of Histology and Embryology)
ROBERT MATHESON, Ph.D.	Entomology (Professor of Entomology)
LOREN CLIFFORD PETRY, Ph.D.	Paleobotany and Elementary Botany (Professor of Botany)
HUGH DANIEL REED, Ph.D.	General Zoology and Morphology (Professor of Zoology)
LESTER WHYLAND SHARP, Ph.D.	Cytology (Professor of Botany)
FREDERIC CAMPION STEWARD, Ph.D.	Plant Physiology (Reader in Plant Physiology, Leeds University, England)
ROY CARLETON TASKER, A.M.	Zoology (Instructor in Zoology)
DONALD STUART WELCH, Ph.D.	Plant Pathology (Assistant Professor of Plant Pathology)
KARL MCKAY WIEGAND, Ph.D.	Plant Taxonomy (Professor of Botany)
ALBERT HAZEN WRIGHT, Ph.D.	Systematic Zoology (Professor of Zoology)
BENJAMIN PERCY YOUNG, Ph.D.	Invertebrate Zoology (Assistant Professor of Zoology)

GENERAL PLANS AND AIMS

The Summer School of Biology was organized to provide instruction of the highest grade in zoology, botany, and allied subjects. All the regular facilities of the University are at the disposal of the student, and as far as possible the staff has been restricted to teachers of professorial rank in the University. The courses are for the most part those given during the regular academic year condensed into a period

of six weeks, but not abridged. The work is particularly planned to meet the needs of teachers and graduate students who wish to know, in addition to the subject matter, something of the methods and sources in teaching; but undergraduates also, if sufficiently prepared, will find the courses adapted to their needs. Intensive rather than extensive work is necessarily expected of each student, as the courses are comprehensive. These courses lead toward advanced degrees, and special attention is given to graduate students pursuing research. Students interested in graduate study should, if possible, consult by letter with Professor K. M. Wiegand, representing the School of Biology, or with the professor concerned, before coming to Ithaca.

The intensive interest in Biology at Cornell University over a period of years has resulted in a wealth of laboratory material. Very extensive and in some cases unique collections of both plants and animals, and a very complete working library, are available to students prepared to make use of them. Ithaca is located in the Finger Lakes region of Central New York, noted not only for its picturesque beauty, but for its richness in biological material of both plants and animals. In this respect the University is perhaps not excelled by any other institution in the country. The collecting grounds are for the most part adjacent to the campus, and can be very readily visited. Within easy reach of the laboratories are fresh-water marshes and lakes, salt springs, marl springs, marl bogs, peat bogs, extensive ravines with numerous waterfalls, and upland woods or fields overlying either calcareous or noncalcareous sandy or heavy soils. The country shows a considerable variation in elevation, thus giving samples of several life zones. It is therefore possible to use as illustrative material those inland organisms which may be obtained most readily by teachers throughout the country for use in their own classes.

[A limited amount of change in the hours scheduled may be made by the staff at the beginning of the session to avoid conflicts. In the case of morning laboratories the student may obtain permission, at the option of the instructor, to be absent for a period to attend a lecture in some other course. The time so lost is to be made up later.]

COURSES DEALING PRIMARILY WITH PLANTS

S 1. General Botany. Credit six hours. Equivalent to Botany 1. Lectures, M T W Th F, 8-9:30. Laboratory, M T W Th F, 9:30-12:30. One recitation and conference period each week, at an afternoon hour to be arranged. One afternoon field trip each week. The afternoons should be reserved for the recitations and field trips. By permission, students may be absent from the laboratory period for one hour to attend another course, making up the work in the afternoons. *Plant Science* 262. Professor PETRY and Dr. JACKSON.

A survey of the fundamental facts and principles of plant life. The structures and life processes of higher plants are examined in some detail, with considerable attention to information necessary for more advanced or practical work with plants. Representatives of the principal groups of plants are then studied, with a view to acquainting the student with the plant kingdom as a whole. The principal families of flowering plants are examined and practice in identification is given.

The field work is intended to afford to teachers and others first-hand knowledge of the commoner plants of all the great groups. Facilities for collecting plant materials for teaching or other purposes will be provided. Laboratory fee, \$7.

S 2. Plant Physiology. Credit four hours. Equivalent to Botany 31. Prerequisite course S 1 or its equivalent, chemistry, and permission to register. Lectures, M T W Th F, 12. Laboratory, T W Th F, 9-12. *Plant Science* 227. Dr. STEWARD.

This course is designed to acquaint the student with the important life processes of plants. Topics such as water-relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, and growth relations are studied in some detail and particular emphasis is placed both in laboratory and in classroom on discussions of the principles and their application to growing plants. Laboratory fee, \$4; deposit, \$2.

S 3. Taxonomy of Vascular Plants. Credit four hours. Equivalent to Botany 117. Prerequisite course S 1 or its equivalent. Lectures, M T W Th, 2. Laboratory, M T W Th, 3-6, F, 2-5. Several all-day field trips will be arranged. *Plant Science* 211. Professor WIEGAND.

A study of the kinds of seed plants and ferns; their classification into genera, families, and orders; and field work on the local flora. Emphasis will be placed on wild plants, but the more common cultivated plants will have some attention. The course is planned to follow Course S1 and to furnish an introduction to the knowledge of field botany and to the classification of the higher plants, in preparation for special work in various departments and as an aid in teaching. Instruction will be given in herbarium methods. Laboratory fee, \$4; deposit, \$5.

S 4. Comparative Morphology of Fungi. Credit four hours. Equivalent to Plant Pathology 121. Prerequisite course S 1 or its equivalent and permission to register. Lectures, M T W Th F, 9. *Plant Science* 333. Laboratory, fifteen actual hours a week, by arrangement. *Plant Science* 333. Professor FITZPATRICK.

An elementary synoptical course designed to acquaint the student with the general field of mycology. Emphasis is placed on morphology and phylogeny, rather than on taxonomy, but abundant opportunity is given for field work. Laboratory fee, \$6; deposit, \$3.

S 7. Mycology. Credit four hours. Prerequisite courses S 1 and S 4 or their equivalent and permission to register. Lectures, M T W Th F, by appointment. Laboratory, fifteen actual hours a week, by arrangement. *Plant Science* 333. Professor FITZPATRICK.

An advanced course designed for students who wish to specialize in mycology or plant pathology. An intensive study of the morphology, taxonomy, cytology, and phylogeny of the fungi. Emphasis is placed on the field work, with extensive practice in determination of material. The individual student may obtain the equivalent of either term of Plant Pathology 221 or Plant Pathology 222, and by repeating the course in successive summers may get the other terms. Any one of the following groups may be elected: (a) Phycomycetes, (b) Ascomycetes, (c) Basidiomycetes, (d) Uredinales, Ustilaginales, Fungi Imperfecti, and Myxomycetes. Laboratory fee, \$6; deposit, \$3.

S 8. Morphology of Vascular Plants. Credit four hours. Prerequisite course S 1 or an equivalent and permission to register. Laboratory, M T Th F, 8-11:30. Hours for lectures and recitations will be arranged during these periods. *Plant Science* 228. Professor EAMES.

An advanced course in the comparative morphology, life history, and phylogeny of vascular plants. Laboratory fee, \$5.

S 10. General Plant Pathology. Credit four hours. Equivalent to Plant Pathology 1. Prerequisite Botany S 1 or its equivalent and permission to register. Lectures, M W F, 2. *Plant Science* 336. Laboratory, the completion of a minimum of twenty exercises requiring not less than twenty actual hours a week, with personal conferences upon each. Conferences by arrangement. Laboratory at the student's convenience. Assistant Professor WELCH.

A fundamental course treating of the nature, cause, and control of plant diseases illustrated by studies of the commoner diseases of cultivated crops. Laboratory fee, \$4.50; deposit, \$3.

S 19. Special Problems with Plants. Credit two or more hours. Hours to be arranged. In registering for this course the name of the professor with whom the work is to be taken must be stated.

Students sufficiently prepared may arrange for the study of some problem or special topic. Such work may lie in the fields of general or taxonomic botany, anatomy, comparative morphology, mycology, cytology, plant physiology, paleobotany, plant pathology, or genetics. A member of the staff must supervise the work.

COURSES DEALING PRIMARILY WITH ANIMALS

S 20. General Zoology. Credit six hours. Lectures, M T W Th F, 9. *McGraw* 5. Laboratory, M T W Th F, 1:40-4:30. *McGraw* 2 A. Field studies and original problems to be arranged. Professor REED and Assistant Professor YOUNG.

A comprehensive view of Animal Biology including the principles of structural and physiological organization, the cell as the basis of metabolism, reproduction, and heredity, the organismal concept of the individual, the progress of perfection of animal types, the biological nature and zoological position of man, and interpretations of modern zoological theory. Laboratory fee, \$5.

S 21. Systematic Vertebrate Zoology and Ecology. Credit four hours. Lectures, M T W Th, 1:40-2:30. Laboratory and field work, M T W Th F, 2:30-5:30. *McGraw*. Several all-day trips are required. Occasionally a field trip, 5:30-8 A.M. or 5-8 P.M., may be substituted for the regular periods. Dr. HAMILTON. Professor WRIGHT will be present from July 5 to 12 and from August 9 to 16.

Lectures on fishes, amphibians, reptiles, birds, and mammals; their habits, life-histories, coloration, respiration, locomotion, reproduction, and adaptations; together with their classification, nomenclature, characters, and relationships. Laboratory study of the parts employed in the classification of these groups, with training in the identification of two hundred and forty North American species. Field work is partly to give practice in field observations and in ready identification of local vertebrates in their natural environment, and partly to introduce some ecological methods. Textbook: Jordan's *Manual of Vertebrates of the North-eastern United States*, New edition. Laboratory fee, \$4.

S 22. Invertebrate Zoology. Credit four hours. Prerequisite Zoology S 20 or an equivalent and permission to register. Daily except Sat., 9-12:30. *McGraw*. Lectures, field trips, laboratory work, and discussions will be arranged during these periods. Assistant Professor YOUNG.

This course should provide a better foundation for the advanced student in the field of zoology or give to the teacher a knowledge of a larger variety of forms available for use in general courses either in high schools or in colleges. It differs from the type of invertebrate course offered by marine biological laboratories in that stress is laid upon many species which may be secured in the living state away from the shore. Methods used in collecting and the study of habitats are the more important objectives of the field trips. Classification, structure, and life cycles are emphasized in the laboratory. Laboratory fee, \$3.

S 23. Comparative Anatomy of Vertebrates. Credit four hours. Lectures, daily except Sat., 8. *McGraw* 5. Laboratory, fifteen hours a week at times to be arranged. Professor REED and Mr. TASKER.

A thorough dissection and study of the several systems of organs in a selected series of vertebrate types. The various systems are considered with reference to their significance in progressive modifications and their bearing upon vertebrate descent. The lectures deal with the problems of comparative anatomy. This course is the equivalent of Animal Biology 11 given during the academic year. Laboratory fee, \$6.

S 26. Histology. The tissues and their histogenesis. Credit four hours. No prerequisite, but previous work in biology, zoology, and botany or physiology is recommended. Lectures, M T W Th F, 12. The laboratory will be open every afternoon except Saturday. *Stimson*. Professor KINGSBURY.

For students of biology or those preparing for medicine. The cell and cellular origin of the body; the structure and development of its component tissues. Each student will prepare or receive a series of typical microscopic preparations.

The courses in histology and embryology are given in the histological laboratories in *Stimson Hall*. The department is well equipped for instruction in both subjects, having a large and adequate supply of modern microscopical instruments and an extensive collection of demonstration material for both histology and embryology. Microscopes are furnished by the department. Consultation with the instructors previous to registration is advised. Laboratory fee, \$6.

S 27. Embryology of Vertebrates. Credit four hours. Prerequisite a course in the histology of the tissues or a satisfactory equivalent in other biological work involving training in the use of the microscope. Lectures, M T W Th F, 9. The laboratory will be open every morning except Saturday. *Stimson*. Assistant Professor ADELMANN.

For students of biology or those preparing for medicine. Preparation and study of embryological specimens from all the chief groups of vertebrates. Particular emphasis is placed on the embryology of the chick. The student also acquires a knowledge of special methods useful in embryological work. Laboratory fee, \$6.

S 30. General Entomology. Credit three hours. Equivalent to Animal Biology 3 or Entomology 12. Prerequisite Biology 1 or Zoology 1 or its equivalent. Lectures, M T W Th F, 1:40-2:30. Practical exercises, M W F, 2:30-5. *Roberts* 392. Professor MATHESON.

This course includes lectures and demonstrations on the characteristics of the orders and families of insects, with a study of their habits, life-histories, and relations to other animals and to plants. The laboratory work consists of the study of the structure, ecology, metamorphosis, and classification of insects. Field trips to study insects in their natural habitats are an important feature. Each student is required to collect and prepare a typical collection of insects. Opportunities are given for the rearing of insects in the Insectary, and special work is offered to suit the needs of individual students. Textbook: Comstock's *Manual for the Study of Insects* (1930 Edition). Equipment: a good hand lens, several insect cases, insect pins, and labels. These can all be purchased in Ithaca. Laboratory fee, \$2.50.

S 31. Elementary Morphology of Insects. Credit three hours. Equivalent to Entomology 21. Twenty actual hours a week, by appointment. *Roberts* 391. Professor JOHANNSEN.

This course deals with the external and internal anatomy of several representative insects as the locust, roach, cicada, honeybee, crane fly, etc. Laboratory fee, \$2.

S 32. Elementary Systematic Entomology. Credit two hours. Equivalent to Entomology 15 and 31a. Prerequisite course S 31. Fifteen actual hours a week, by appointment. *Roberts* 391. Professor JOHANNSEN.

The principles of wing venation and the classification of the orders and families. Laboratory fee, \$2.

Courses S 31 and S 32 are required of all students who plan to take advanced work in Entomology.

S 34. Advanced Morphology, Histology, and Embryology of Insects. Credit one hour. Prerequisite courses S 31 and S 30 or S 32 or equivalent. M W F, 8. Lectures, assigned reading, and reports. *Roberts* 392. Professor JOHANNSEN. This course will be given if four or more students register for it. In the summer of 1931 it will deal with the embryology of insects.

S 35. Histology of Insects. Credit two hours. Must be preceded or accompanied by course S 31. Laboratory, fifteen actual hours a week, by appointment. *Roberts* 391. Professor JOHANNSEN.

Technique in histological methods as applied to insects. Laboratory fee, \$3.

S 39. Special Problems with Animals. Credit two hours or more. Hours to be arranged. In registering for this course the name of the professor with whom the work is to taken must be stated.

Students sufficiently prepared may arrange for the study of some problem or special topic. Such work may lie in the fields of general zoology, invertebrate zoology, systematic vertebrate zoology, comparative anatomy of vertebrates, ornithology, histology, embryology, general entomology, systematic entomology, economic entomology, or general biology. A member of the staff must supervise the work.

GENERAL COURSES DEALING WITH BOTH PLANTS AND ANIMALS

S 40. **Genetics.** Credit four hours. Prerequisite elementary botany and plant physiology, or elementary zoology and animal physiology, and permission to register. Courses in cytology and in taxonomic botany or zoology will be found helpful. Lectures, M T W Th F, 8. Laboratory, M W F, 1:40-4. Conferences to be arranged. *Plant Science* 146. Assistant Professor FRASER.

A general introductory course designed to acquaint the student with the fundamental principles of heredity and variation. Special attention is given to the Mendelian interpretation of the facts of inheritance. Among the topics to be discussed are: the physical basis of heredity; determination of sex; factor linkage; measurement of variation; quantitative inheritance; pure lines; inbreeding and cross-breeding; cytoplasmic inheritance; and mutation; with suggestions as to the relation of genetical principles to eugenics. Laboratory studies of variation and of the laws of heredity as illustrated by hybrid material in plants and by breeding experiments with the fruit fly, *Drosophila*. Laboratory fee, \$3.

S 6. **Cytology.** Credit three hours. Prerequisite course S 1 or course S 20 or their equivalent and permission to register. Laboratory, M T Th F, 9-12:30, usually with a lecture at 9. *Plant Science* 219. Professor SHARP.

A course for those who have had some fundamental work in biology. The principal topics studied are protoplasm, cells and their components, nuclear and cell divisions, meiosis and fertilization, together with their bearing on the problems of development, reproduction, and heredity. Both plant and animal materials are used. Microtechnique is not included. Laboratory fee, \$5.

S 42. **General Bacteriology.** Credit four hours. Prerequisite some work in Inorganic Chemistry and in microscopy. Lectures, M T W Th F, 9. Laboratory, M T W Th F, 10-1. *Veterinary College*. Professor HAGAN.

A general introductory course in bacteriology covering the distribution, morphology, biology, and methods of study of micro-organisms. The latter half of this course is concerned with the bacteriology of water, sewage, milk, and milk products, the fermentation industries, and of some of the more important human and animal diseases. The laboratory work is closely correlated with the subject matter of the lectures. After a number of sessions devoted to the development of technique, there follows work on the bacteria of air, water, milk, fermentation processes, and of disease. Laboratory fee, \$10.

NEW YORK STATE SUMMER SESSION

AT

CORNELL UNIVERSITY

OFFICERS

LIVINGSTON FARRAND, A.B., M.D., L.H.D., LL.D., President of the University.
ALBERT RUSSELL MANN, B.S., A.M., D.Sc., D. Agr., Dean of the Colleges of Agriculture and Home Economics.

ROLLAND MACLAREN STEWART, B.A., Ph.D., Professor of Rural Education and Director of the New York State Summer Session.

CORNELIUS BETTEN, Ph.D., D.Sc., Director of Resident Instruction in the Colleges of Agriculture and Home Economics.

MARTHA VAN RENSSELAER, A.B., D. PED., Director of the College of Home Economics.

FLORA ROSE, B.S., M.A., Director of the College of Home Economics.

OLIN WHITNEY SMITH, B.S., Secretary of the Colleges of Agriculture and Home Economics.

ELLEN FITCHEN, A.B., Secretary in the College of Home Economics.

STAFF OF INSTRUCTION

(The names of the instructors in the College of Agriculture are printed on page 64; those of the instructors in the College of Home Economics, on page 81; those of the instructors in the Summer School of Biology, on page 55.)

COURSES OF INSTRUCTION

Courses of instruction are offered in the New York State Summer Session under the auspices of the New York State College of Agriculture and of the New York State College of Home Economics. These courses are designed primarily to meet the needs of persons engaged in the various forms of educational work concerned with agriculture, home economics, science, and other subjects of study particularly related to the problems of rural life. Teachers, supervisors of instruction, superintendents or principals of schools, extension workers, parents, dietitians, students interested in the study of farm and home practices, camp directors, and others responsible for the improvement of rural workers have primary consideration in the program of courses.

ADMISSION

Admission to classes is limited to regularly registered students. No examinations are required for entrance, but the candidate for admission must show that he is qualified to pursue the work offered. He must register for all courses that he expects to attend whether or not he wishes credit. He must register for a minimum of four hours unless he has special permission of his adviser and the approval of the Director. Advice for registration is given through regular advisers who are members of the Summer Session staff, and who approve the registration cards. See page 63 for the directions about registration.

The graduate student should consult the representative of his major subject if he is matriculating for a regular degree; or the Chair-

man of the Division of Education if for the Master's degree in Education; or an adviser selected by the student from the members representing his field of work if he is not a candidate for a degree. See page 6 of the 1930-31 *Announcement of the Graduate School*. Note the University regulation concerning vaccination on page 7 of the same announcement.

TUITION AND FEES

Tuition in the New York State Summer Session is free to students who are residents of New York and who have been residents for at least one year immediately preceding registration, except those registered in the Summer School of Biology, the Summer Courses in Hotel Administration, and the Graduate School. (See pages 14 to 16 for full announcement of tuition and fees.) An incidental fee of ten dollars is, however, charged to all students resident of New York unless registered in the Graduate School.

Persons coming from outside the state of New York, whether they take one course or more, will pay sixty dollars, except persons registered for special unit courses, see page 80, who will pay at the rate of ten dollars a week, and graduate students who pay on the Graduate School rate. See page 14.

Graduate students, if they have not previously matriculated in Cornell University, must pay also a matriculation fee of ten dollars. See page 15.

Candidates for advanced degrees who are registered for study under Personal Direction during the intersemester periods are required to pay an administration fee of ten dollars. Such students in the Graduate School as are not exempt from summer course tuition fees, may be permitted to take one or more subjects in any of such courses upon the payment of a part of the regular tuition fees. See page 16 for a complete statement.

In certain courses laboratory fees are charged and in others charges are made for materials used. These are indicated in the descriptions of the courses. Fee cards must be secured from the instructor at the first exercise, and must be returned to him receipted within five days.

A fee of three dollars (one dollar for each period for students in special unit courses) is charged for the privileges of Willard Straight Hall. See page 21.

ACADEMIC CREDIT

A student who has previously satisfied the entrance requirements for the College in which he wishes credit may obtain credit for work in the New York State Summer Session up to a limit of eight semester hours. Rarely, however, should students plan to register for more than six semester hours. Students are not permitted to visit classes but may register for courses which they desire to attend without credit, if the instructor is willing. Residence credit is given if six hours are passed, but not more than a total of two semesters of residence may be obtained by attendance at summer sessions.

Candidates for degrees should consult the announcements of the respective colleges, since much of the work required for degrees, if offered in the Summer Session at all, is distributed over a period of years. For the requirements for the degree of Bachelor of Science (eight semesters, 122 hours, etc.) see the announcements of the New York State College of Agriculture and the New York State College of Home Economics. For advanced degrees see the *Announcement of the Graduate School*.

TEACHERS' CERTIFICATES

The New York State Department of Education through its Teacher Training Division is responsible for the certification of teachers. The courses offered during the summer enable students to meet these requirements. For information on certificates for work done, see page 12.

GENERAL INFORMATION

For other information of a general character, see pages 9 to 21.

DIRECTIONS FOR REGISTRATION

Students should observe the following directions to simplify registration and avoid confusion:

1. Note on page 14 that Monday, July 6, is Registration Day. The student should plan to register on that day if possible.
2. Go directly to the office of the Secretary in Roberts Hall and secure a registration card.
3. Take this card to a staff adviser in Roberts Assembly, who will assist in the selection of courses and give further direction if needed.
4. When the selection is completed and the schedule is approved return the card to the Secretary's office for official approval.
5. Pay tuition and fees at the office of the Treasurer, Morrill Hall.

SUMMER SCHOOL OF AGRICULTURE

in the

NEW YORK STATE COLLEGE OF AGRICULTURE

STAFF OF INSTRUCTION

BRISTOW ADAMS, B.A.	Rural Education
(Professor in Extension Service, Editor of Publications)	
ARTHUR AUGUSTUS ALLEN, Ph.D.	Ornithology
(Professor of Ornithology)	
ELSA GUERDRUM ALLEN, Ph.D.	Ornithology
(Instructor in Ornithology)	
THOMAS LEVINGSTON BAYNE, JR., Ph.D.	Rural Education
(Assistant Professor of Rural Education)	
FREDERICK GARDNER BEHREND, M.S.	Rural Education
(Director, Hope Farm School, Verbank, New York)	
JEROME H. BENTLEY, M.A.	Rural Education
(Secretary for Education, New York City Y. M. C. A.)	
HARRY E. BRADFORD, M.S.	Rural Education
(Chairman, Division of Vocational Education, University of Nebraska)	
FRANK PORES BUSSELL, Ph.D.	Plant Breeding
(Professor of Plant Breeding)	
JULIAN EDWARD BUTTERWORTH, Ph.D.	Rural Education
(Professor of Rural Education)	
CARL G. CHAMBERLAIN.	Physical Education
(Director of Physical Education, Charlotte High School, Rochester)	
PETER WALTER CLAASSEN, Ph.D.	Biology
(Professor of Biology)	
CHARLES W. CLARK, B.S.	Rural Education
(Director of Schenectady Vocational Schools)	
JAMES E. CROUCH, B.S.	Ornithology
(Assistant in Ornithology)	
RALPH WRIGHT CURTIS, M.S.A.	Floriculture and Ornamental Horticulture
(Professor of Ornamental Horticulture)	
THEODORE HILDRETH EATON, Ph.D.	Rural Education
(Professor of Rural Education)	
RALPH ALMON FELTON, M.A.	Rural Social Organization
(Extension Professor of Rural Social Organization)	
EMERY N. FERRISS, Ph.D.	Rural Education
(Professor of Rural Education)	
CLYDE FISHER, Ph.D., LL.D.	Rural Education
(Curator of Education and Astronomy, American Museum of Natural History, Washington, D. C.)	
ROBERT G. FOSTER, Ph.D.	Rural Social Organization
(Agriculturist for Eastern States, Cooperative Extension, United States Department of Agriculture)	
ARTHUR KENDALL GETMAN, B.S.	Rural Education
(Chief, Agricultural Education Bureau, State Department of Education)	
EVA L. GORDON, M.S.	Nature Study
(Assistant in Nature Study)	
EDWIN SHEPHERD HARRISON, B.S.	Animal Husbandry
(Instructor in Animal Husbandry)	
VAN BREED HART, Ph.D.	Agricultural Economics and Farm Management
(Extension Professor of Farm Management)	
HELEN H. HEYL, M.A.	Rural Education
(Assistant, Rural Education Bureau, State Department of Education)	
HAROLD C. HOFFSOMMER, Ph.D.	Rural Social Organization
(Associate Professor, Alabama Polytechnic Institute, Auburn, Alabama)	

EDWIN RAY HOSKINS, M.S.A.	Rural Education
(Instructor in Rural Education)	
RALPH SHELDON HOSMER, M.F.	Forestry
(Head of the Department of Forestry)	
CHESTER JERMAIN HUNN, B.S.A.	Floriculture and Ornamental Horticulture
(Assistant Professor of Ornamental Horticulture)	
OSKAR AUGUSTUS JOHANNSEN, Ph.D.	Entomology
(Professor of Entomology)	
PETER PAUL KELLOGG, B.S.	Nature Study
(Instructor in Ornithology)	
PAUL J. KRUSE, Ph.D.	Rural Education
(Head of the Department of Rural Education)	
ROBERT MATHESON, Ph.D.	Entomology
(Professor of Entomology)	
ALFRED MARTIN MEYER, A.M.	Rural Education
(Director, Junior High School, Orlando, Florida)	
LUA ALICE MINNS, M.S.A.	Floriculture and Ornamental Horticulture
(Instructor in Floriculture)	
CLYDE B. MOORE, Ph.D.	Rural Education
(Professor of Rural Education)	
RICHARD ALAN MORDOFF, Ph.D.	Meteorology
(Professor of Meteorology)	
WALTER CONRAD MUENSCHER, Ph.D.	Botany
(Assistant Professor of Economic Botany)	
WILLIAM IRVING MYERS, Ph.D.	Agricultural Economics and Farm Management
(Professor of Farm Finance)	
BERTHA TYLER NELSON, M.A.	Rural Education
(Teacher of Home Economics, Junior High School, New York City)	
JAMES BECKLEY PALMER, Ph.D.	Rural Education
(Director, Department of Rural Education, State Normal School, Potsdam)	
GEORGE ERIC PEABODY, M.S.	Extension Teaching
(Assistant Professor of Extension Teaching)	
FRANK ASHMORE PEARSON, Ph.D.	Agricultural Economics and Farm Management
(Professor of Prices and Statistics)	
JOSEPH PULLMAN PORTER, M.S.A., M.L.D.	Floriculture and Ornamental Horticulture
(Extension Assistant Professor of Ornamental Horticulture)	
JAMES EDWARD RICE, B.S.A.	Poultry Husbandry
(Head of the Department of Poultry Husbandry)	
LOUIS MICHAEL ROEHL, B.S.	Agricultural Engineering
(Assistant Professor of Agricultural Engineering, in charge of Farm Shop)	
JAMES MORGAN SHERMAN, Ph.D.	Dairy Industry
(Head of the Department of Dairy Industry)	
CLIFFORD NICKS STARK, Ph.D.	Dairy Industry
(Assistant Professor of Bacteriology)	
ROLLAND MACLAREN STEWART, Ph.D.	Rural Education
(Director of the New York State Summer Session and Professor of Rural Education)	
EDWARD AUGUST TAYLOR, M.A.	Rural Social Organization
(Instructor in Rural Social Organization)	
RALPH AUGUSTINE WALDRON, Ph.D.	Rural Education
(Head of Science Department, State Teachers' College, Slippery Rock, Pennsylvania)	
GEORGE FREDERICK WARREN, Ph.D.	Agricultural Economics and Farm Management
(Head of the Department of Agricultural Economics and Farm Management)	
FLORENCE E. WINCHELL, M.S.	Rural Education
(Formerly Director Home Economics Department, State Teachers College, Albany)	

ANDREW LEON WINSOR, Ph.D.	Rural Education (Acting Assistant Professor of Rural Education)
LOUIS EDWARD WOLF, Ph.D.	Biology (Instructor in Biology)
LAWRENCE C. WOODRUFF, M.A.	Biology (Assistant in Biology)
PAUL WORK, Ph.D.	Vegetable Crops (Professor of Vegetable Crops)
FORREST BLYTHE WRIGHT, M.S.	Agricultural Engineering (Instructor in Agricultural Engineering)

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

S 102. Farm Management. Credit three hours. Lectures, daily except Sat., 10. Laboratory, T 1:40-4, S, all day. *Farm Management 102.* Professor MYERS.

It is desirable that this course be preceded by courses dealing with the production of crops and animals or that the student have considerable farm experience in crop and animal production.

Lectures, recitations, laboratory practice, and field trips. Farming as a business; types of farming; size of business; balance of business; rates of production; farm layout; building arrangement; machinery; buying and selling; ways of starting to farm; forms of tenure and leases; choosing and buying a farm; use of capital and credit; planning, organization, and management of specific farms. Field trips to near-by farms will be made on Saturdays. Trips begin at 8 a.m. One two-day trip will probably be arranged. Laboratory fee, \$2.

S 102a. Farm Management for High School Teachers. Credit one hour. Lectures, daily except Sat., 9. *Plant Science 141.* Laboratory, M W, 1:40-4, August 3 to 14. Professor HART.

A special unit course for high school teachers, county agents, and other agricultural leaders who are not taking Farm Management S 102, or who wish a brief review of Farm Management.

Fundamental principles of Farm Management with special attention to selecting a region, choosing and buying a farm, getting and keeping credit, types of farm accounts to be kept, sources of recent farm-management information and the preparation of economics information for teaching purposes.

S 111. Agricultural Statistics. Credit two hours. Lectures, M W F, 9. Laboratory, M W, 1:40-4. *Farm Management 102.* Professor PEARSON.

Classification of data; frequency distributions; means and variables; gross, partial, and multiple correlations; and analysis of time series. Fee for materials, \$3.

S 115. Agricultural Prices. Credit two hours. Lectures, daily except Sat., 8. *Farm Management 102.* Professor PEARSON.

Factors affecting farm prices.

S 151. Public Problems of Agriculture. Credit two hours. Lectures, daily except Sat., 11. *Farm Management 102.* Professor WARREN.

A discussion of some of the more important problems of agriculture that involve collective or governmental action.

S 168. Special Lectures on Economic and Educational Problems. Credit one or two hours. Lectures, M W F, 12. Discussion period, M W F, 4. *Farm Management 102.* Credit one hour for those who take the 12 o'clock lectures only; two hours for those who take both periods. Department of Rural Education co-operating. Professor HART in charge.

A series of discussions by non-resident lecturers of certain economic and educational problems related to agriculture.

S 209. Farm Management for Extension Workers. Credit two hours. Lectures, daily except Sat., 10. *Plant Science 141.* Laboratory, Th, 1:40-4. *Farm Management 102.* Professor HART.

A course for economic extension specialists, county agents, and teachers of agriculture. Analyzing the results of economic research for extension purposes; preparation of economic extension bulletins and agricultural outlook reports;

preparation of farm account books and organization of farm account schools; interpretation of farm records and accounts; organization of county agricultural economic boards and county agents' economic conferences; farm management tours; preparation of charts; and other phases of economic extension projects. Several lectures and discussions will be given by economic extension specialists from other states, and from the extension service of the United States Department of Agriculture. One all-day trip will probably be taken. Laboratory fee, \$2.

AGRICULTURAL ENGINEERING

S 40a. Farm Shop. Credit two hours. T Th, 1:40-4, and S, 8-1. *Agricultural Engineering Laboratory.* Assistant Professor ROEHL.

A course for teachers of agriculture in farm carpentry and such correlated drawing as farmers may find helpful in construction and repair work; selection and care of farm shop tools; study of the steel square; tool grinding, saw filing, fitting handles, window repairing; painting and refinishing. Special consideration is given to preparing men to teach this work as a part of the vocational course in agriculture. Laboratory fee, \$3.

Students for whose programs the hours given above present conflicts, should see the instructor.

S 40b. Farm Shop. Credit two hours. M F, 1:40-4 and S, 8-1. *Agricultural Engineering Laboratory.* Assistant Professor ROEHL.

A course for teachers of agriculture in farm shop work including the following: harness repairing, rope work, soldering, belt lacing, cold metal working, farm blacksmithing. Special attention is given to the selection of jobs, to the best methods of doing these jobs, and to degrees of skill which should be attained in the performance of them. Students will be expected to demonstrate the performance of one such job. Consideration is given to the tool equipment necessary to meet the repair and construction problems arising on various kinds and sizes of farms. The farm blacksmithing work is confined mainly to such forge work as will aid in the repairing of farm machinery and in the shaping and tempering of cold chisels, punches, picks, harrow teeth, etc. Laboratory fee, \$3.

S 40c. Farm Shop. Credit three hours for three special units of two weeks each. Units may be taken separately for one hour of credit each. T Th, 9-12 and any other three hours F S, 9-12. *Agricultural Engineering Laboratory.* Mr. WRIGHT.

Unit 1, July 6 to 18, electricity and its application to the home and the farm.

Unit 2, July 20 to August 1, automobiles and single cylinder gasoline engines.

Unit 3, August 3 to 14, plumbing, farm water systems, and farm machinery.

These courses are intended to give methods of learning and to teach manipulative skill.

S 41. General Shop Work for Rural High School Teachers. Credit three hours. M W, 9-12 and any other three hours T, Th, or F, 9-12. *Agricultural Engineering Laboratory.* Assistant Professor ROEHL and Mr. WRIGHT.

A course in training for teaching general industrial arts work in rural high schools. Practical jobs to develop skill in woodwork, drawing, soldering, electricity, plumbing, fitting tools, painting and glazing, concrete work, furniture refinishing, automobile care and repair, as suited to the needs of the youth of a community. Laboratory fee, \$3.

A course in the organization and methods of teaching industrial arts, including the making of curricula is offered in the Department of Rural Education. See S 142, page 75.

ANIMAL HUSBANDRY

S 50a. Feeding the Dairy Cow for Milk Production. Credit one or two hours. M W F, 10-12. Laboratory, M W, 1:40-4. August 3 to 14. For two hours' credit, see instructor for additional periods. *Animal Husbandry A.* Mr. HARRISON.

A special-unit course for teachers of agriculture, county agents, and other agricultural leaders, dealing with the special problems of feeding the dairy cow and their solution in the light of scientific investigation.

BACTERIOLOGY

S 1. General Bacteriology. Credit two or four hours. Lectures, daily except Sat., 1:40. Laboratory, daily except Sat., 2:30-4:30. *Dairy* 119. Professor SHERMAN and Assistant Professor STARK.

An introductory course giving a general survey of the field of bacteriology, together with the fundamentals essential to further work in the subject. The morphology, physiology, and classification of bacteria; the culture of micro-organisms, simple and differential staining, and general bacteriological technique; the bacteriology of soil, air, water, sewage, milk, and foods; the principles of immunity and the microbiology of disease.

Laboratory fee, \$10, for those seeking four credit hours.

BIOLOGY

S 1. Biology I. Credit three hours. Lectures and recitations, daily except Sat., 9. *Roberts* 392. Laboratory and field work, M W F, 1:40-4; other sections by special arrangement. *Roberts* 302. Professor CLAASSEN and Mr. WOODRUFF.

This course is designed to acquaint the general student and the prospective teacher with the main ideas of biology through selected practical studies of the phenomena on which biological principles are based. Lectures, laboratory work, and field trips will deal with such topics as: interdependence of organisms as illustrated by insects and flowers, insects and galls, etc.; the simpler organisms, such as amoeba, paramoecium, flagellates, and other protozoans; and algae, fungi, bacteria, and slime molds among plants. The study of these simpler organisms will be followed by studies of such plant types as liverworts, mosses, and ferns and such animal types as hydra, earthworm, insects, and frog. Students completing this course will be given credit for the first term's work in Biology I of the regular academic year. Laboratory fee, \$3.50.

S 2. Laboratory Methods in Biology. Credit two hours. Conferences and laboratory work, M W F, 10-1. *Roberts* 302. Dr. WOLF and Mr. WOODRUFF. Intended primarily for teachers of biology. Instructor's permission necessary for registration.

This course takes up the problem of laboratory technique, the collection and preservation of class material, the general equipment of the laboratory, and other questions encountered in the management of a laboratory. Teachers who wish to study methods of teaching are referred to Course S 126 in Rural Education. Laboratory fee, \$3.

S 3. Biology II. Credit three hours. Lectures, M T Th F, 11. *Roberts* 392. Field work and laboratory exercises, T Th F, 1:40-4. *Roberts* 302. Prerequisite Biology I, college biology, botany, or zoology. Professor CLAASSEN and Dr. WOLF.

A course dealing with the biological principles of plant and animal life. Heredity, variation, natural selection, mutation, adaptation, life cycle, and metamorphosis, are some of the topics for consideration. Special emphasis is placed upon field studies of the ecological relationships of organisms and students should come prepared for field work.

This course, although not identical with the second term biology of the regular year, will be accepted in place thereof. Laboratory fee, \$3.50.

SUMMER SCHOOL OF BIOLOGY

Under the auspices of the New York State College of Agriculture and the Summer Session of Cornell University, there has been brought together a group of courses dealing with the biological sciences. These courses furnish an excellent opportunity for students of the biological sciences to have access to a series of studies from year to year in one of the most appropriate locations in the country. For full information see page 55.

BOTANY

S 13. Trees and Shrubs. Credit two hours. Lectures and laboratory, M W, 1:40-5:30, or T Th, 1:40-5:30. Additional trips to be arranged. *Plant Science* 353. Assistant Professor MUENSCHER.

A course intended for those who wish to know the woody plants in the field. The aim is to familiarize the student with as many as possible of the trees and shrubs of the Cayuga Lake flora and to teach the main facts of structure, growth, habit, and distribution concerning them. Some all day trips will be required. Laboratory fee, \$1.50; deposit, \$3.

Other courses dealing with plants are offered in the Summer School of Biology. See page 56.

ENTOMOLOGY

S 30. General Entomology. Credit three hours. Identical with S 30 in the Summer School of Biology. Prerequisite Biology 1, or Zoology 1 or its equivalent. Lectures, daily except Sat., 1:40. Practical exercises, M W F, 2:30-5. *Roberts* 392. Professor MATHESON.

This course embraces lectures and demonstrations on the characteristics of the orders and families of insects: their habits, life histories, and relations to other animals and to plants; methods of rearing, studying, collecting, and mounting insects.

The laboratory work will consist in the study of structure, ecology, metamorphoses, and classification of insects. Field trips to study insects in their natural habitats are an important feature. Each student is required to collect and prepare a typical collection of insects. Opportunities are given for the rearing of insects in the Insectary, and special work is offered to suit the needs of individual students. Textbook: Comstock's *An Introduction to Entomology*. Equipment: a good hand lens, several insect cases, insect pins, and labels. These can all be purchased in Ithaca. Laboratory fee, \$2.50.

S 31. Elementary Morphology of Insects. Credit three hours. Twenty actual hours a week, by appointment. *Roberts* 391. Professor JOHANNSEN.

This course deals with the external and internal anatomy of several representative insects, such as the locust, roach, cicada, honeybee, crane fly, etc. Laboratory fee, \$2.

EXTENSION TEACHING

S 100. Oral Expression. Credit two hours. Lectures and practice, daily except Sat., 10. *Roberts* 131. Criticism by appointment, daily 8-1. Registration limited to twenty-five students. Open only to upperclassmen and regular summer school students. Assistant Professor PEABODY.

For special-unit courses see Rural Education, Course 238, page 75.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

S 1. Woody Plant Propagation and Nursery Work. Credit one hour. Lectures, T Th, 9. Laboratory, W F, 1:40-4. Laboratory fee, \$3. *Plant Science* 40 and *Nursery*. Assistant Professor HUNN.

This course includes the methods of propagation of all classes of ornamental woody plants and their special treatment during the first stages of growth. It also acquaints the student with the principles governing the transplanting of trees, shrubs, and herbaceous perennials, and with the methods practiced in all types of commercial nursery management. Should be accompanied by S 3 and S 4. All members of the class must participate in an excursion to some New York State nursery on July 31.

S 3. Landscape Planting. Credit two hours. Lectures and laboratories, T, 10-1, T, 1:40-4:30, W 11-1. Should be accompanied by S 6 and must be accompanied by S 4. All members of the class must participate in the department excursion to Rochester on August 7 and 8. *Plant Science* 433. Assistant Professor PORTER.

A brief course intended to familiarize the student with the best trees, shrubs, and vines, with special emphasis upon their use. Names, characteristics, and requirements will be studied in the field and in the laboratory. The lectures will deal with planting practices and the selection and arrangement of plants. Laboratory fee, \$3. Registration limited to 16. Consult department office when registering.

S 4. Landscape Planning. Credit two hours. Lectures and laboratories, W, 8-11, Th, 10-1, Th, 1:40-4:30. Should be accompanied by S 6 and either S 3 or S 8 is required. All members of the class must participate in the department excursion to Rochester on August 7 and 8. *Plant Science* 433. Assistant Professor PORTER.

A discussion of the fundamental principles of landscape planning as related to home grounds, school grounds, and other landscape improvement work. A brief course, not professional, intended for students who desire an intelligent point of view but who do not intend to take technical courses. Laboratory fee, \$3. Registration limited to 16. Consult department office when registering.

S 5. Indoor Flower Growing. Credit one hour. Lectures, T Th, 11. Laboratory, T, 1:40-4:30. *Plant Science* 15. Miss MINNS.

The propagation and culture of plants suitable for winter gardens in homes and schoolrooms, including a study of containers, soils, fertilizers, insecticides. The selection of varieties of bulbs and methods of culture indoors are considered, as are also the method of propagation and general care of species of plants suited for indoor culture. Laboratory fee, \$1.

S 6. Garden Flowers. Credit two hours. Lectures, M T Th, 9, F, 12. Laboratory, W F, 1:40-4:30. *Plant Science* 15 and *Greenhouses*. Miss MINNS. Laboratory fee, \$2.

This course, planned primarily for graduate and advanced students in floriculture and ornamental horticulture, comprises a study of herbaceous plant materials. The aim is to give the student such an intimate knowledge of these forms of plants as may be used in garden planting, either on home grounds, rural social centers, or public parks, more particularly with reference to summer conditions. Students must have had sufficient botany to be familiar with the botanical characters and classification. An excellent collection of plant material is available for demonstrations. All members of the class will participate in an excursion to the Thompson Estate at Canandaigua on August 7 and 8.

S 8. Woody Plant Materials for Landscape Planting. Credit four hours. Lectures, M T Th F, 8. Laboratory and field trip, M T, 10-12:30, W Th, 11-1, M T, 1:40-4:30. *Plant Science* 29 and *Campus*. Professor CURTIS. Intended for graduate students and advanced students in floriculture and ornamental horticulture. Laboratory fee, \$3.

A study of the characteristics and requirements of trees, shrubs, and vines for landscape planting. The laboratories and field trips enable the student to recognize common woody plants. The lectures discuss planting areas, planting practices, and plant materials, in order that the student may learn to see plants not only as growing things but as possible units in designs with which he may be able to improve his surroundings. All members of the class must participate in an excursion to Rochester on August 7 and 8 to visit private estates and public parks. The transportation charge will be \$5.

S 9. Summer Propagation. Credit two hours. Lectures, W Th, 10. Laboratories, W 8-10, Th 1:40-4:30, F 9-12. *Greenhouses* and *Nurseries*. Assistant Professor HUNN. Intended for students who have had the beginning course in propagation. See S 1. Laboratory fee, \$3.

Advantage is taken of the summer months to amplify the regular and summer courses in propagation by intensive practice in the summer production of soft wood cuttings and in the budding of nursery stocks. This will include the management of hot beds and the lining-out system followed in the production of stock plants. Two extra hours a week before and after classes are required for care of hot beds. Two one-day trips are planned for visits to producing nurseries on July 10 and 31.

FORESTRY

S 1. The Identification of Trees. Credit one hour. Lectures, T Th, 8. Field work, T, 1:40-4:30. *Fernow 122.* Professor HOSMER.

Identification of the more important trees of the Ithaca region. Characteristics of forest trees that may be observed at various seasons of the year. Tree seeds and their dissemination. The commercial uses of a few of the principal trees. This course should be helpful to teachers in connection with their work in nature study and biology. See Biology S 1 and Rural Education S 7a.

S 4. Forests and Forestry. Credit two hours. Lectures, daily except Sat., 9. *Fernow 122.* Professor HOSMER.

This course is designed to meet the requirements of those who wish an elementary knowledge of forestry. Topics to be considered: the nature and scope of forestry; the economic importance of forests to the nation, including the influence of forests on stream-flow and the relation of the forest to recreation; the forest as a biological unit; methods employed in the perpetuation of forests; brief description of the forest regions of the United States; the present status of Federal, State, and private forestry.

This course should be helpful to teachers in secondary schools whose syllabuses in Biology, Civics, Economics, Physical Geography, and General Science include forestry topics.

METEOROLOGY

S 1. Meteorology and Climatology. Credit two hours. Lectures and discussions, daily except Sat., 10. *East Roberts 222.* Professor MORDOFF.

This course is adapted to the needs of teachers and students in subjects of which weather and climate are important factors, particularly teachers of physical geography and general agriculture. It is designed to acquaint the student with the laws governing the primary and secondary circulation of the atmosphere and with the development, progression, and conditions that attend cyclones, tornadoes, and other atmospheric phenomena. Attention is given to the principles and practice of weather forecasting from weather maps and from local observations.

S 2. Meteorology and Climatology Laboratory Course. Credit one hour. W F, 1:40-4, or other periods to be arranged. Must be accompanied by Course S 1. *East Roberts 341.* Professor MORDOFF.

The work consists in the study of the principal weather and climatic elements with the aid of maps, charts, and instruments. The various meteorological instruments will be studied, as well as the methods of taking and recording the observations.

NATURE STUDY

Cornell University is admirably located for the study of nature in the field. Fish hatcheries, state and municipal parks, museums, and game farms are convenient to the campus and to those who wish to study the methods there followed in addition to becoming acquainted with the wild life in its natural setting. For description of the courses offered in Nature Study see Rural Education, pages 74-75.

ORNITHOLOGY

S 11. Ornithology. Credit three hours. Lectures, M W, 11 *McGraw 5.* Laboratory, M W, 1:40-4:30, or T Th, 1:40-4:30. Field work, M W, or T Th, 5:30-8 A. M. Professor ALLEN, Dr. ALLEN, and Mr. CROUCH.

This course gives an introduction to the study of birds and familiarity with the local species. The lectures cover such subjects as classification, migration, coloration, song, nest-building, eggs, care of young, methods of attracting birds, and their economic importance. The laboratory work with bird skins gives an intimate knowledge of the birds of Eastern North America and familiarity with the use of a manual. The aim of the field work is the identification of birds by their songs and habits as well as by their plumage. Each student should be provided with field or opera glasses. Laboratory fee, \$3.

S 131. Applied Ornithology. Credit two hours. Lectures, laboratory, and field work. M W, 1:40-4:30, and other hours by appointment. *McGraw*. Open only to those who are taking the elementary course or who have had its equivalent. Professor ALLEN.

This course is intended to meet the needs of students who plan further study of ornithology. The lectures cover the field open to prospective ornithologists, methods of study and teaching, preparation of specimens and lantern slides, bird photography, wild life conservation, and game farming. The laboratory and field work will give practical exercises. Laboratory fee, \$3.

PHYSICAL EDUCATION

Arrangements have been made whereby men in the Summer School of Agriculture may register in Physical Education S 11, upon the payment of a \$15 tuition fee.

S 11. High School Athletics (Men). Daily except Sat., 2-4. *GS 134*. Mr. CHAMBERLAIN.

The high school attitude toward athletics as a part of the school curriculum; the present day tendencies in the various states; with emphasis upon methods of handling high school boys and upon training for leadership. The second hour will be devoted to practical work in the fundamentals of football and basketball, with tactics of offense and defense. The course is intended primarily not to train for professional coaching, but to supply information, material, and practice to those who may be called upon to coach in connection with their other teaching.

PLANT BREEDING

S 103a. Plant Breeding. Credit one hour. Lectures, M, 10-12, W, 11. Laboratory, M T W, 1:40-5:30. July 20 to 31. *Plant Science 146*. Professor BUSSELL.

A discussion of the principles concerned in plant breeding and crop improvement, and of the technic of hybridization, selection, seed production and distribution. The course is intended for plant producers, seed growers, county agents, and teachers of agriculture in secondary schools.

POULTRY HUSBANDRY

S 137a. Outstanding Points in Managing a Poultry Business. Credit one hour. Lectures, demonstrations, and laboratory exercises. Daily except Sat., 9, Th F, 10-12. July 20 to 31. *Poultry 325*. Professor RICE.

A course of sixteen lectures, demonstrations, and laboratory exercises for teachers of agriculture, extension workers, and poultrymen, arranged on a job-analysis basis, designed to present the outstanding problems in the poultry business and to indicate how these should be met. Among the problems considered are: selecting a place to carry on the business; equipment for mass production and ease of operation; selection for vitality and production by physical examination; flock replacement, reducing mortality, business methods.

RURAL EDUCATION

EDUCATIONAL PSYCHOLOGY AND MEASUREMENT

	Page
S 111a { Psychology for Students of Education.....	73
S 111b {	
S 116 Psychology for Students of Child Training.....	73
S 150 Mental and Educational Measurement.....	73
S 151 Educational Measurement.....	74

EDUCATIONAL METHOD

S 7a The Teaching of Nature Study.....	74
S 121b Method and Procedure in Teaching in the Secondary School.....	74
S 122 The Child-Centered School.....	74
S 126 The Teaching of Science in the Rural Secondary School.....	74

S 127	Visual Aids in Teaching.....	74
S 128	The Teaching of Natural History in the Field.....	74
S 132	The Teaching of Vocational Agriculture in the Secondary School.....	75
S 132a	Building Courses of Study in Vocational Agriculture.....	75
S 132b	Organizing the Supervised Practice Program in Vocational Agriculture.....	75
S 142	Organization and Methods of Teaching Industrial Arts.....	75
S 226	Foundations of Method.....	75
S 235	The Teaching of Homemaking in the Secondary School.....	75
S 235a	The Teaching of Home Management in the Secondary School....	75
S 235b	The Teaching of a Home Economics Survey Course in the Secondary School.....	75
S 238	Methods in Extension Work (Special Units).....	75

EDUCATIONAL ADMINISTRATION AND SUPERVISION

S 17	The Curriculum of the Junior-Senior High School.....	76
S 175a	The Principalship of the Centralized and Village School.....	76
S 245	College Preparation of Teachers of Agriculture for Departments in the Secondary School.....	76
S 248	The Preparation of Teachers of Home Economics.....	76
S 262c	The School Plant.....	76
S 262e	The Central Rural School District.....	76
S 263	Procedures and Techniques in Supervision.....	76
S 267a	The Administration of a State System of Schools for Vocational Agriculture.....	77
S 274	The Curriculum of the Rural School.....	77

HISTORY AND PRINCIPLES OF EDUCATION

S 28	Educational and Vocational Guidance.....	77
S 181	Principles of Education.....	77
S 182	History of American Education.....	77
S 194	Education and Vocations.....	77
S 281	The High School in Rural and Village Communities.....	77
S 288	Adult Education.....	77
S 298	Philosophy of Education for Extension Workers.....	77

EDUCATIONAL PSYCHOLOGY AND MEASUREMENT

S 111a. **Psychology for Students of Education.** Credit two hours. Daily except Sat., Section 1, 10, *Caldwell* 100; Section 2, 11, *Caldwell* 250. Assistant Professors BAYNE and WINSOR.

A point of view in psychology for students of education. The nature of man with emphasis on the tendencies to behavior basic to learning. The learning process. Individual differences.

S 111b. **Psychology for Students of Education.** Credit two hours. M W F, 7:30-8:50. *Caldwell* 250. Professor KRUSE. Prerequisite S 111a or its equivalent. Students who have not had S 111a should confer with instructor before registering for this course.

Following the argument of S 111a, more extended treatment will be given to selected topics in the psychology of learning, such as special aspects of the laws of learning; trial and error in learning; the conditioned response; controlled thinking.

S 116. **Psychology for Students of Child Training.** Credit two hours. Daily except Sat., 11, *Caldwell* 100. Professor KRUSE. Prerequisite 111 or S 111a or equivalent. Students offering an equivalent are requested to confer with instructor before registering. This course may be taken in lieu of 116 given during the regular year.

S 150. **Mental and Educational Measurement.** Credit two hours. Daily except Sat., 9, *Caldwell* 143. Assistant Professor WINSOR.

A beginning course for students of child training and for teachers of the primary and intermediate grades. A study will be made of individual and group tests in relation to development, diagnosis, and classification of young children.

S 151. Educational Measurement. Credit two hours. Daily except Sat., 8. *Caldwell* 100. Assistant Professor BAYNE.

A beginning course for teachers in the upper grades of the elementary school and in the high school. Measurement in relation to the classification of pupils, the determination of the progress of pupils, individual difficulties, and the determination of final marks. Typical tests and scales and elementary statistical terms and methods will be studied in their relation to these problems.

EDUCATIONAL METHOD

S 7a. The Teaching of Nature Study. Credit two hours. Lectures, M W F, 10. *Fernow* 122. Field and laboratory work, T Th, 10-12:30 or 1:40-4. *Fernow* 8. Dr. FISHER, Dr. WALDRON, Miss GORDON, and Mr. KELLOGG.

To acquaint teachers with the principles and methods of education through nature study and to give practice which will permit them to carry on the work independently. The lectures present types of organization of nature study work and methods of presenting subject matter. Six field trips and six laboratory periods furnish experience in the study of birds, mammals, trees, herbs, insects, and earth science, and include practical methods for conducting nature study work.

Laboratory and field work open only to those taking the work for credit.

S 121b. Method and Procedure in Teaching in the Secondary School. Credit two hours. Daily except Sat., 10. *East Roberts* 232. Dr. PALMER.

This course deals with certain principles of teaching in junior and senior high schools, and their application to such problems as selecting and organizing teaching materials, planning class work, making assignments, providing for individual differences, determining classroom and laboratory procedures, directing study, managing classes, measuring the pupil's achievement.

S 122. The Child-Centered School. Credit two hours. Daily except Sat., 10. *Caldwell* 143. Miss HEYL.

Designed for administrators, supervisors, and advanced teachers to consider the basic principles and appropriate procedures in the conduct of a child-centered school.

S 126. The Teaching of Science in the Rural Secondary School. Credit two hours. Daily except Sat., 9. *Fernow* 16. Dr. WALDRON.

A study of the science program in rural high schools; the functions of the recognized high-school sciences such as general science, biology, zoology, physics, chemistry, and earth science, together with methods of teaching. Designed primarily for experienced teachers.

S 127. Visual Aids in Teaching. Credit two hours. Daily except S., 8. *Fernow* 8. Dr. FISHER.

A consideration of the use of visual materials and equipment in schools, with suggestions for the preparation of materials and of sources of supply. Practice will be provided for use of projection apparatus and other equipment.

S 128. The Teaching of Natural History in the Field. Credit three hours. Lecture, M 12. *Fernow* 8. Field work, F, 1:40 to S., 8 p.m. Dr. FISHER, Dr. WALDRON, Professors WRIGHT, NEEDHAM, HARRIS, PETRY, HOSMER, CLAASSEN, and ALLEN, and Miss GORDON and Mr. KELLOGG.

This course is designed primarily to acquaint experienced science teachers with methods of field studies suitable for use in public school teaching and in teacher-training institutions. Trips will combine a variety of ecological sites with the observation of methods used by leaders in botany, ornithology, general ecology, entomology, forestry, astronomy, and paleontology. Practice will be given in field teaching under supervision. Students will live in the field from Friday noon to Saturday night. The privilege of advance registration is extended. Enrollment is limited to twenty. Applicants should file with Professor Palmer detailed records of their teaching experience and training in science. Students will furnish their own bedding, pup tents, or sleeping bags. Meals and transportation will be supplied at cost and for the six weeks will not exceed \$20 to be paid in advance.

S 132. The Teaching of Vocational Agriculture in the Secondary School. Credit two hours. Lectures, M T Th F, 9. Laboratory, W 1:40-4. *Caldwell 282.* Mr. HOSKINS.

Designed for teachers of agricultural courses or for students preparing to teach such courses. A study of the problems confronting the teacher of agriculture; the vocational point of view in instruction; determination of courses of study from field studies and analyses; forms used in teaching; the selection of materials and their organization for instruction purposes; the relationships of the agriculture teacher to the other agencies of agricultural training in the community.

S 132a. Building Courses of Study in Vocational Agriculture. Credit one hour. Daily except Sat., 8. Laboratory, Th F, 1:40-5:00. July 20 to 31. *Caldwell 282.* Mr. HOSKINS.

S 132b. Organizing the Supervised Practice Program in Vocational Agriculture. Credit one hour. Daily except Sat., 8. Laboratory, T Th, 1:40-5:00. August 3 to 14. *Caldwell 282.* Mr. GETMAN and Mr. HOSKINS.

S 142. Organization and Methods of Teaching Industrial Arts. Credit two hours. Daily except Sat., 8. *Agricultural Engineering Laboratory.* Open to students of vocational education who are interested in the teaching of industrial arts. Mr. CLARK.

A course required for certification to teach Industrial Arts Courses. Consideration is given to the point of view in industrial arts education, aims and objectives, the organization of instructional materials and the courses of study for the small high school; related subject matter commonly taught; the management of the shop, including shop equipment and shop procedures.

S 226. Foundations of Method. Credit two hours. Daily except Sat., 10. *Goldwin Smith 183.* Professor MOORE.

This course is designed primarily for experienced elementary and high-school teachers and supervisors. It will include a critical examination of current and proposed educational methods in the light of accepted principles of educational psychology.

S 235. The Teaching of Homemaking in the Secondary School. Credit two hours. Daily except Sat., 9. *East Roberts 232.* Miss NELSON.

This course is particularly designed to assist teachers in improving their methods of teaching. Study will be made of recent investigations in the field of homemaking and of their bearings upon the homemaking curriculum in secondary schools, the content of courses, methods of teaching, and evaluation of results.

S 235a. The Teaching of Home Management in the Secondary School. Credit one hour. Daily except Sat., 10. July 6 to 24. *Caldwell 294.* Miss WINCHELL.

This unit includes study of child guidance and family relationships. Emphasis is centered on integrating into a unified course problems of work, leisure, responsibilities, and adjustments in personal and home life. Open only to students who have had courses in methods of teaching home economics and in child guidance and home management. Students should confer with the instructor before registering.

S 235b. The Teaching of a Home Economics Survey Course in the Secondary School. Credit one hour. Daily except Sat., 10. July 27 to August 14. *Caldwell 294.* Miss WINCHELL.

This unit deals with the body of home economics material which can be profitably and successfully taught to students not majoring in homemaking. It will also include study of the content of courses for boys.

Open only to students who have had courses in methods of teaching home economics and in child guidance and home management. Students should confer with the instructor before registering.

S 238. Methods in Extension Work. Credit two hours. Daily except Sat., 8. *Roberts 392.*

(a) Public speaking for extension workers. July 6 to 17. Assistant Professor PEABODY.

(b) Use of the press in extension work. July 20 to 31. Professor ADAMS.

(c) Method demonstrations and result demonstrations in extension work. August 3 to 14. Mr. BEHREND.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

S 17. The Curriculum of the Junior-Senior High School. Credit two hours. Daily except Sat., 10. *Goldwin Smith* 221. Mr. MEYER.

Special emphasis will be placed upon the curriculum in its relation to the large aims of the secondary school. The complementary nature of the junior and the senior high school will receive particular attention.

S 175a. The Principalship of the Centralized and Village School. Credit two hours. Daily except Sat., August 3 to 14. First meeting, M, 8. *Fernow* 210. Professor FERRISS.

A unit course dealing with the practical problems of principals of smaller high schools who are also responsible for the organization, administration, and supervision of the elementary grades.

S 245. College Preparation of Teachers of Agriculture for Departments in Secondary Schools. Credit two hours. Daily except Sat., 9. *Caldwell* 250. Professor STEWART.

Open to graduate students in agricultural education. A study of the organization and conduct of curricula for prospective teachers of agriculture in vocational departments of rural high schools.

S 248. The Preparation of Teachers of Home Economics. Credit two hours. Open to graduate students of approved qualifications. Daily except Sat., 8. *Caldwell* 294. Miss WINCHELL.

This course is designed to meet the needs of persons who have had both technical preparation in home economics and teaching experience, and who desire to prepare for the special problems involved in the professional work of preparing teachers of home economics. It treats collegiate and secondary curricula in home economics with reference to the technical preparation of teachers, their professional needs, supervised teaching experience, and the organization and content of special-method courses in home economics.

S 262c. The School Plant. Credit two hours. Daily except Sat., 8. *Caldwell* 143. Professor BUTTERWORTH.

Standards for school buildings; measurement of school building facilities; planning the building program to meet the needs of the community; financing school buildings; the utilization of the school plant; modern equipment; and the like. Since this course will be organized upon the problem basis, each member of the class will find it useful to bring with him data from his own school. For a statement of the types of data needed write to the instructor in charge.

S 262e. The Central Rural School District. Credit two hours. Daily except Sat., 10. *Caldwell* 250. Professor BUTTERWORTH.

This course is planned especially for those superintendents and principals of New York State who face the problem of organizing a central rural school district. It will deal with such questions as: determining whether such a district is to be desired; the area to be included in the district; organizing the transportation system; planning the building facilities; getting the public to accept the proposed organization; developing the new area into an effective educational unit. Members of the class will find it useful to bring with them data regarding some proposed central district in which they are interested. For details write to the instructor in charge.

S 263. Procedures and Techniques in Supervision. Credit two hours. Daily except Sat., 11. *Caldwell* 143. Professor MOORE.

Designed for supervisors, principals, and experienced teachers who expect to do supervisory work. A consideration of the nature and purpose of supervision; the improvement of the learning-teaching process; skill in observation; analysis of methods; relationships between general and specific objectives; selection, analysis, and organization of subject matter; measuring and testing results; assisting teachers in professional growth. The experience and needs of the class will determine the emphasis and nature of treatment of these various aspects.

S 267a. The Administration of a State System of Schools for Vocational Agriculture. Open to graduate students in agricultural education who are registered for S 194, S 245, or S 262e. Credit one hour. MW, 2-3:30. *Caldwell* 143. Professor STEWART.

A study of the organization of a state plan for the administration of departments and schools of vocational agriculture under the National Vocational Education Act.

S 274. The Curriculum of the Rural School. Credit two hours. Daily except Sat., July 20 to 31. First meeting, M, 8. *Fernow* 210. Miss HEYL.

This course is especially designed for district superintendents of the State of New York. It will deal with some of the major problems involved in providing modern curricula for children in rural schools.

HISTORY AND PRINCIPLES OF EDUCATION

S 28. Educational and Vocational Guidance. Credit two hours. Daily except Sat., 9. *GS* 120. Mr. BENTLEY.

A study of the larger aims and problems of guidance in secondary education; of the present status and trends in the guidance movement; of the guidance agencies and resources and methods of utilizing them; of school organization and curricular adjustments appropriate to the ends of guidance, etc.

S 181. Principles of Education. Credit three hours. Daily except Sat., 11-12:30. *East Roberts* 232. Dr. PALMER.

An integrating course designed to give an orientation in modern education. Among the topics to be treated are the nature and significance of education; biological, psychological, and social foundations; educational aims and values; the curriculum; the functions and relations of the various school levels; the relation of the theory of education to practice. This course meets certification requirements in this field.

S 182. History of American Education. Credit two or three hours. For third hour confer with instructor. Daily except Sat., 10. *Caldwell* 282. Professor BRADFORD.

The origin and development of American educational movements and institutions with particular reference to the development of vocational education, the demand for the practical in education, and the response on the part of the schools to this demand.

S 194. Education and Vocations. Open to those who have completed courses in Educational Psychology and in Economics or Sociology. Credit two hours. Daily except Sat., 11. *Caldwell* 282. Professor EATON.

A study of vocational education from the point of view of a democratic philosophy of education.

S 281. The High School in Rural and Village Communities. Credit two hours. Daily except Sat., 9. *Caldwell* 100. Professor FERRISS.

A course dealing with basic problems of modern secondary education in its adaptation to rural and village conditions. Among the topics considered are the scope and functions of secondary education; present demands upon the rural and village high school; types of secondary school organization and their adaptation; program of studies and curriculum organization and content; pupil guidance, extra-class activities, needed forms of extension work, etc.

S 288. Adult Education. Credit two hours. Daily except Sat., 8. *East Roberts* 222. Professor BRADFORD.

A course designed for leaders in the field of vocational education. The ability of adults to learn; the need for adult education in agriculture, trades, industry, and home economics; and programs based upon abilities and needs.

S 298. Philosophy of Education for Extension Workers. Credit two hours. Daily except Sat., 9. *Caldwell* 492. Professor EATON.

A consideration of the educational aims and values of cooperative extension work in agriculture and home economics.

RURAL SOCIAL ORGANIZATION

S 1. General Sociology. Credit two hours. Lectures and discussions. Daily except Sat., 8. *Fernow 118.* Assistant Professor **HOFFSOMMER.**

The aims of the course are two: first, to study the structure and functions of society; second, to give an appreciation of processes and forces which may be directed to wholesome societal development. The social structure, activities, influences, controls, and changes as exemplified in both urban and rural life constitute the subject matter of this study.

S 12. The Sociology of Rural Life. Credit two hours. Lectures and reports. Daily except Sat., 11. *Fernow 118.* Assistant Professor **HOFFSOMMER.**

This course consists (1) of an examination of the sociological structure of rural life, which furnishes the basis for (2) the analysis of rural problems. Some of the problems considered are health, education, religion, standards of life, the family, government, social life, and recreation. These problems are considered as a phase of community organization and as such are analyzed in their sociological aspects. Students are expected to draw specific material from their own communities.

S 16. Recreational Leadership. Credit two hours. Daily except Sat., 9. Two additional hours in the afternoon each week are required for practice in leading games. Hours to be arranged. *East Roberts 222.* Professor **FELTON.**

The aim of this course is to prepare students for recreational leadership in schools, granges, churches, and other community meetings. The following subjects are considered: the educational value of play; the periods of childhood and their relation to a course of play and games; play as physical training; play for the development of social relations; play for the formation of habits and character; the place of play in the home; the home playroom and playyard; school playgrounds; community playgrounds; recreation in the program of the church; recreational programs for community halls; and play days in rural schools.

S 121. The Family. Credit two hours. Daily except Sat., 10. *Fernow 118.* Dr. **FOSTER.**

This course is concerned with the social problems of the family both on the farm and in the city; the history of the family, particularly during the past century; the differences between family life in the country and in the city; the function of the family in society; marriage and divorce; relations of parents and children; and how the family may be conserved. Fee for materials, \$1.

S 122. Social Problems and Public Welfare Organization. Daily except Sat., 8. *Fernow 308.* Mr. **TAYLOR.**

A study of social problems such as poverty, crime, delinquency, the physically handicapped, the feeble-minded and mentally diseased, social insurance, mothers' pensions, unemployment, etc.; public and private agencies for social work; public policy regarding their organization and support.

S 132. Rural Leadership. Credit two hours. Daily except Sat., 9. *Fernow 118.* Dr. **FOSTER.**

A seminary course in the sociology and psychology of rural leadership with particular reference to the training of leaders by extension workers and teachers.

VEGETABLE CROPS

The courses have been planned to meet the needs of advanced and graduate students from this and other institutions as well as for secondary teachers. A program may be chosen entirely in this field, but preferably in combination with other subjects. Schedules have been arranged to avoid conflict with certain courses in other departments that have proved of interest to vegetable gardening students. Resident study during the summer and including the Summer School may be counted toward an advanced degree if proper arrangements are made. Two years, attendance at Summer School permits taking both course S 12 and course S 13, which are given in alternate years. Send for special circular.

[S 1. **Vegetable Crops.** Credit two hours. Not given in 1931.]

S 12. Grading and Handling Vegetable Crops. Credit two hours. Lectures and laboratory, T Th, 2-6. *Ithaca Gardens.* Professor **WORK.**

The geography of vegetable production and distribution. Market and table quality and grades; influence of environment, culture, handling, and storage upon quality and marketability; methods of harvesting, grading, packing; inspection, transportation, refrigeration, and storage. One all-day trip and two half-day trips will be made; approximate total cost, \$10. Laboratory fee, \$2.

[S 13. **Types and Varieties of Vegetables.** Credit two hours. Offered in alternate years. Not given in 1931.]

S 101a. **Advanced Vegetable Crops.** Credit two hours. Lectures, daily except Sat., 8. *East Roberts* 232. Professor WORK.

This course is concerned with results of research in growing and handling vegetables, with special attention to the evaluation of results and their application to practical problems, but with brief treatment of research methods. Emphasis is placed on recent work and on the use of rather than the production of research results. Designed for teachers, county agents, and graduate or advanced undergraduate students.

S 221. **Special Problems in Vegetable Gardening.** Credit two or more hours. Hours to be arranged. Open to graduate students and advanced undergraduates with adequate preparation. *Poultry* 174. Professors WORK and HARDENBURG, Assistant Professors KNOTT and SMITH.

A study of some specific topic of the growth of vegetable crops, or of the handling of vegetable products. This may involve a critical review of the literature of some special subject, or the investigation of some special phase of the research projects under way in the greenhouse or gardens. Students may, by special arrangement, continue the work throughout the summer.

SPECIAL UNIT COURSES IN THE SUMMER SCHOOL OF AGRICULTURE

Teachers of agriculture and home making, county agents and other extension leaders, district superintendents, high school principals and other educational leaders find it difficult oftentimes to be away from their duties for six weeks. Owing to the growing demand for courses of less than six weeks' duration a group of courses is offered for the convenience of these workers. See the respective departments for schedule and description of courses as indicated below.

	Page
FIRST PERIOD, July 6 to 17	
<i>Agricultural Engineering</i>	
S 40c. Unit 1. Electricity and Its Application to the Farm and Home.	67
<i>Rural Education</i>	
S 238a. Public Speaking for Extension Workers. (Cooperating with Extension Teaching).....	75
SECOND PERIOD, July 20 to 31	
<i>Agricultural Engineering</i>	
S 40c. Unit 2. Overhauling Single Cylinder Gasoline Engines and Automobiles.....	67
<i>Plant Breeding</i>	
S 103a. Plant Breeding and Crop Improvement.....	72
<i>Poultry Husbandry</i>	
S 137a. Outstanding Problems in Poultry Business.....	72
<i>Rural Education</i>	
S 132a. Building Courses of Study in Vocational Agriculture.....	75
S 238b. Use of the Press in Extension Work.....	75
S 274. The Curriculum of the Rural School.....	77
THIRD PERIOD, August 3 to 14	
<i>Agricultural Economics and Farm Management</i>	
S 102a. Farm Management for High School Teachers.....	66
<i>Agricultural Engineering</i>	
S 40c. Unit 3. Plumbing, Farm-home Water Systems, and Farm Machinery.....	67
<i>Animal Husbandry</i>	
S 50a. Feeding the Dairy Cow for Milk Production.....	67
<i>Rural Education</i>	
S 132b. Organizing the Supervised Practice Program in Vocational Agriculture.....	75
S 175a. The Principalship of the Centralized and Village School.....	76
S 238c. Method Demonstrations and Result Demonstrations in Extension Work.....	75
Note that courses S 235a and S 235b are offered also for less than the six weeks' period. See page 75.	

SUMMER SCHOOL OF HOME ECONOMICS

IN THE

NEW YORK STATE COLLEGE OF HOME ECONOMICS

STAFF OF INSTRUCTION

OLGA P. BRUCHER, M.A.	Foods and Nutrition (Assistant Professor of Home Economics)
ELLA J. DAY, Ph.D.	Household Management (Associate Professor of Home Economics, University of Tennessee)
DOROTHY C. DELANY, B.S.	Extension Education (Assistant State Leader of Home Demonstration Agents)
MARIE BELLE FOWLER, M.A.	Child Guidance (Professor of Home Economics)
MARY FRANCES HENRY, M.A.	Foods and Nutrition (Professor of Home Economics)
BESS C. McDERMAND, B.S.	Textiles and Clothing (Assistant State Leader of Home Demonstration Agents)
CAROLYN BRUNDAGE McILROY	Textiles and Clothing (Co-director of Costume Shop)
GRACE MORIN, M.A.	Household Art (Professor of Home Economics)
CAROLINE MORTON, M.A.	Extension Education (Extension Assistant Professor of Home Economics)
MAMIE RUSSELL MUTZ, Ph.B.	Household Art (Associate Professor of Home Economics, The Stout Institute, Menomonie, Wisconsin)
CLARIBEL NYE, M.A.	Extension Education (State Leader of Home Economics Extension, Oregon State Agricultural College)
JEAN PATTISON, M.D.	Child Guidance (Pediatrician)
KATHERINE M. REEVES, B.A.	Child Guidance (Instructor in Home Economics)
RACHAEL SANDERS, M.S.	Foods and Nutrition (Instructor in Home Economics)
ALMA FINCHER SCIDMORE	Household Art (Instructor in Home Economics)
DOROTHY BARNARD SCOTT, B.A.	Household Art (Assistant Professor of Home Economics)
RUTH JEAN SCOTT, B.S.	Textiles and Clothing (Assistant Professor of Home Economics)
RUBY GREEN SMITH, Ph.D.	Extension Education (Associate State Leader of Home Demonstration Agents)
MARTHA VAN RENSSELAER, A.B., D.Ped.	Extension Education (Director of the College of Home Economics)
ETHEL B. WARING, Ph.D.	Child Guidance (Professor of Home Economics)

COURSES OF INSTRUCTION

The courses offered in the Summer School of Home Economics are designed to meet the needs of graduate and advanced students for teaching, extension, and general vocations requiring home economics training.

FAMILY LIFE

Courses in child development and parent education form a part of a family life program. They are aimed to promote efficient,

harmonious, and wholesome home life by giving parents, pre-parents, and teachers an understanding of child nature, its needs, and its guidance. Since it is impossible to gain adequate, practical information about children unless opportunity is offered for observing them, a nursery school having twenty-four children between the ages of two-and-a-half and four-and-a-half years is maintained as a laboratory for courses in child development. The children are under the direction of experienced nursery-school teachers, psychologists, a dietitian, a trained nurse, and a pediatrician. Students have an opportunity to observe in the nursery school and to attend parent meetings. Successful applicants for all but the orientation course must have had recent training in educational psychology.

Students whose applications for courses in child development and parent education have been accepted will be assigned to laboratory observations at the second meeting of the class.

S 100. General Orientation Course in Child Guidance. Credit two hours. Lectures and discussions, daily except Sat., 8. *Home Economics* 100. Laboratory, three hours a week, by arrangement. *Nursery School*. Laboratory fee, \$5. Professor FOWLER and Miss REEVES.

This course is planned to meet the needs of those general teachers of home economics who are required to teach child care and training in the high schools and who are not eligible for the regular elementary course. This is a general course without child-psychology prerequisites. The object is to promote through observation and discussion some understanding of child needs and of child-child and child-adult relationships. Attention is also given to fundamental principles involved in child development and to the obvious factors that affect child growth.

S 101. Principles in Child Guidance (Elementary Course). Credit three hours. Prerequisite Rural Education 111 (Psychology for Students of Education) or its equivalent. Prerequisite or parallel Rural Education 116 (Psychology for Students of Child Training). Lectures and discussions, daily except Sat., 8, *Home Economics* 310. Laboratory, daily except Sat., one hour by arrangement. *Nursery School*. Laboratory fee, \$7.50. Professor WARING and Miss REEVES.

This course is designed to help students to see children in relation to the adults who guide them. It undertakes to direct them to observe the child's behavior impersonally and objectively; to record accurately what they see; to organize these records so that they disclose the significant and characteristic behavior of children and distinguish between desirable and undesirable behavior and between desirable and undesirable guidance procedures of adults. Application of these principles is made to the behavior of the adult students.

S 125. Home Nursing and Child Hygiene. Credit two hours. Lectures and discussions, daily except Sat., 2. *Home Economics* 100. Dr. PATISON.

This course is planned to meet the needs of teachers required to teach child care and home nursing in the high schools. Its purpose is to help the student to observe and appreciate evidences of good health and the conditions under which good health is promoted, and to give practical knowledge about the prevention of diseases and about nursing techniques in the home.

S 215. Studies in Child Development and Parent Education. Credit two to four hours. For students with preparation satisfactory to the instructor. Hours to be arranged. *Nursery School*. Laboratory fee, \$7.50. Professor WARING.

The course is designed to direct the students in an intensive study of four or more children and of their families in all the phases of child development and parent education available in the department, including laboratory study, home visitation, parent conferences of various sorts, and some experience in small group discussion and large group leadership.

S 220. Participation in Nursery School. Credit three or four hours. Prerequisite Family Life 101, (Principles in Child Guidance) and 107 (Environmental Factors in Child Guidance). *Nursery School.* Laboratory and conference hours to be arranged. Laboratory fee, \$7.50. Professor FOWLER and Miss REEVES.

Open only to a limited number of seniors and graduate students with preparation satisfactory to the instructor. For each hour of credit there is required a total of thirty hours of supervised participation with the children in the nursery school, and one hour each week in conference with the teaching staff.

FOODS AND NUTRITION

S 124 A and B. Food Selection in Relation to the Treatment of Disease. Credit one or two hours. Divided into two periods of three weeks each. This course may be taken for the entire six weeks or either of the two units may be elected separately. Open to graduate or advanced students with preparation in nutrition satisfactory to the instructor. Lectures and discussions, daily except Sat., 11. *Home Economics* 100. Professor HENRY.

This course consists of a study of diet in certain of the more common diseases in which choice of food is an important factor of treatment.

A. First three weeks, July 6 to July 24. Credit one hour. This period will be given mainly to consideration of diet in overweight and underweight, digestive disturbances including spastic constipation, ulcer, and arthritis. Fee for materials, \$2.

B. Second three weeks, July 27 to August 14. Credit one hour. This period will be given mainly to consideration of diet in anemia, diabetes, nephritis, and high blood pressure. Fee for materials, \$2.

During each period effort will be made to adjust the emphasis on different topics to the special needs or interests of the group.

S 221. Survey of Food and Nutrition Problems as Related to High-School Teaching. Credit four hours. Open to graduate and advanced students with preparation satisfactory to the instructor. Daily except Sat., 8-10. *Home Economics* 245. Assistant Professor BRUCHER. Laboratory fee, \$5.

The purpose of the course is to interrelate the subject matter of foods and nutrition. It involves a study of the application of nutrition principles in food selection and preparation; the preparation and serving of meals based on the nutritional needs of the group; a comparison and evaluation of methods of making more effective the nutritional aspect of food study; the use of demonstration animals in teaching health through good nutrition; analysis of results of sound nutrition practice as measured in individual progress; and consideration of source material and literature.

Selections of problems will be made on the basis of actual situations developed in presenting the subject, with special emphasis on individual progress in nutrition and food practices.

S 222 A and B. Nutrition (Advanced Course). Credit one or two hours. Divided into two periods of three weeks each. Students are advised to take both units, but either of the two units may be elected separately. Open to graduate or advanced students with preparation in nutrition satisfactory to the instructor. Lectures and discussions, daily except Sat., 10. *Home Economics* 100. Professor HENRY.

This course is intended, through readings and discussions, to increase familiarity with some of the more important recent advances in nutrition.

A. First three weeks, July 6 to July 24. Credit one hour. A discussion of recent experimental work on protein and growth, vitamins, and the related deficiency diseases. Fee for materials, \$2.

B. Second three weeks, July 27 to August 14. Credit one hour. A discussion of recent experimental work on ash materials in the diet, mainly of the work on iron and copper. Fee for materials, \$2.

During each period an effort will be made to adjust the emphasis on the different topics to the special needs and interests of the group.

TEXTILES AND CLOTHING

S 205. Procedures in Clothing Projects for Extension Teachers. First three weeks, July 6 to 24. Credit one hour. Open to graduate and advanced students. Students should consult the instructor before registering. Laboratory, daily except Sat., 10-12. *Home Economics Costume Shop.* Miss McDERMAND.

This unit is designed for extension teachers or persons interested in extension teaching. It presupposes a relatively good working knowledge of clothing design and sewing processes. The principal purpose of the course is to consider the problems involved in organizing extension programs in clothing, in selecting the problems to be presented in extension work, and in working out illustrative materials for use in efficient presentation, such as mimeograph material, demonstration materials, for construction processes and problems in clothing selection. Laboratory fee, \$3.

S 206. Technique and Skills in Advanced Clothing Construction Projects for Extension or Resident Teachers. Second three weeks, July 27 to August 14. Credit one hour. Open to graduate and advanced students. This course may advantageously follow S 205. Students should consult the instructor before registering. Registration limited to fourteen students in each section. Laboratory, daily except Sat., section 1, 10-12; section 2, 2-4. *Home Economics Costume Shop.* Mrs. McILROY.

A study of dressmaking problems in designing, constructing, fitting, and finishing garments for various types of figures. The members of the class will unite their experiences with those of the instructor, and will then select projects which have particular bearing on their special work. The facilities of the costume shop will be at the disposal of the members of the class. Estimated cost of materials, \$12 to \$15. Laboratory fee, \$3.

S 210 A and B. Clothing for Children. Credit two hours. This course is organized in two units, either of which may be taken separately. Registration limited to sixteen students in each unit. Laboratory, M W F, 11-1. *Home Economics* 305. Two other periods by arrangement. Assistant Professor RUTH J. SCOTT.

This course is intended for teachers of homemaking, extension teachers, or those particularly interested in child development or in parent education. The principal purpose is to bring together the results of scientific experiments in clothing for children as they relate to the child's need of activity, his comfort, his well-being, and his capacities for independent habits in dressing himself. Current literature will be discussed and opportunities will be given for observation of and work with children in the nursery school.

A. First three weeks, July 6 to July 24. Credit one hour. Principles underlying the selection and care of clothing for children. Opportunities will be given for observation of children in the nursery school. Laboratory fee, \$3.

B. Second three weeks, July 27 to August 14. Credit one hour. The construction of children's clothes based upon the needs of the child. Opportunity will be given for observation and fitting of clothes on children at the nursery school. Laboratory fee, \$3.

S 213 A and B. Problems in Costume Design. Credit two hours. This course is organized in two units, either of which may be taken separately. Registration limited to sixteen students in each unit. Open to graduate and advanced students. Students should consult the instructor before registering. Lectures, T Th, 8. *Home Economics* 305. Laboratory, M W F, 8-10. *Home Economics* 305. Assistant Professor RUTH J. SCOTT.

Emphasis is placed on the experimental study of the use of line and color in expressing personalities and individualities. The treatment is organized about principal issues in the teaching of clothing design such as the effect of line in expressing personal characteristics. A comparative study will be made of books and publications dealing with design, with a view to evaluating them as a means of enriching the background of the clothing teacher.

A. First three weeks, July 6 to July 24. Credit one hour. Experimentation in line and color as they may be used to express personality and individuality in clothes. Laboratory fee, \$3.

B. Second three weeks, July 27 to August 14. Credit one hour. The application of line and color to the individual through garment designing. Modeling on the flat patterns and on the dress form. Laboratory fee, \$3.

HOUSEHOLD ART

What is felt as the students' greatest need in the field of household art is the accumulation of power to meet constantly changing situations in which an understanding and appreciation of art principles are factors. In these courses an effort is made to help the student realize that art is not merely a matter of emotion but is thoughtful workmanship and that, since art consists in doing, power can be acquired only through the adventure of experiment. The problem method will therefore be emphasized and an effort made to offer problems whose solutions will be of vital importance.

S 102. Art Essentials in Homemaking. Credit two hours. Registration limited to sixteen students in each section. Lectures and laboratory, daily except Sat., section 1, 11-1; section 2, 2-4. *Home Economics* 415. Professor MORIN.

The practical application of the principles of art to home and community problems. Lectures and discussions on architecture, furniture, textiles, and crafts; trips to homes, schools, and other buildings of interest; student problems in selection and arrangement of furniture, in draperies, and in upholstery materials, including those suitable for school or community rooms. Laboratory fee, \$5.

S 230. Survey of Art Problems. Credit two hours. Open to graduate and advanced students with preparation satisfactory to the instructor. Registration limited to sixteen students in each section. Lectures, daily except Sat., section 1, 8-10; section 2, 2-4. *Home Economics* 300. Associate Professor MUTZ.

An organization of subject matter in integrating art and home economics: a study of different phases of art, such as comparison of color theories and methods of building up effective color schemes; a study of the language of color and line; an analysis of the effects created and of the art quality of these effects. The selection of problems will be made on the basis of actual situations developing in presenting the subject to different groups. Types of experiences will be evaluated in terms of their contribution to individual progress either in improving standards of appreciation or in developing more skill in selecting, arranging, or creating beautiful effects. There will be opportunity for experimentation with different methods and materials to illustrate principles studied and to increase confidence in handling these ideas. Laboratory fee, \$5.

S 240 A and B. Crafts—Block Printing. Credit two hours. Offered primarily for teachers and extension workers. Open to graduate and advanced students with preparation satisfactory to the instructor. Registration limited to sixteen students in each unit. Lectures and laboratory, daily except Sat., 11-1. *Home Economics* 400. Assistant Professor DOROTHY B. SCOTT.

A study of the principles of color and design with immediate application to block printing. Articles will be made suitable for the wardrobe and the home. Guidance will be given in the selection and preparation of illustrative material and a survey made of marketing possibilities.

A. First three weeks, July 6 to July 24. Elementary course. Credit one hour. Prerequisite or parallel course S 102 or a satisfactory equivalent.

Designed to acquaint teachers and extension workers with methods of presenting block printing in their particular fields. Various types of block printing will be considered and many inexpensive but interesting materials will be made into articles of practical use. Laboratory fee, \$3.50. Estimated cost of materials, \$5 to \$10.

B. Second three weeks, July 27 to August 14. Advanced course. Credit one hour. Designed to follow course A, but open to those who have had block printing experience. Methods of block printing in several colors and on a wide range of

materials; combination with stitchery; and more advanced types of design. Laboratory fee, \$3.50. Estimated cost of materials, \$5 to \$10.

S 245 A and B. Home-Furnishing Problems for Teachers and Extension Workers. Credit two hours. Prerequisite S 102 or a satisfactory equivalent. Registration limited to sixteen students in each unit. Lecture and laboratory, daily, except Sat., 9-11. *Home Economics* 415. Mrs. SCIDMORE.

A. First three weeks, July 6 to July 24. Credit one hour. A study of lighting with attention to the decorative possibilities of lighting, various methods of lighting and wiring, types of lighting fixtures, lamp bases and shades, construction of paper and fabric shades. Laboratory fee, \$3.50. Estimated cost of materials, \$5.

B. Second three weeks, July 27 to August 14. Credit one hour. The use of smaller articles in home furnishing. A study principally of the possibilities in old and inexpensive smaller furnishings. Laboratory fee, \$3.50. Estimated cost of materials, \$5.

HOUSEHOLD MANAGEMENT

S 126a. Family Life Aspects of Home Management. Credit two or three hours. For teachers of home economics and extension workers. Courses in the family and in child guidance furnish desirable background. Students with no such background should plan to take such courses. Lectures, M W F, 11. Laboratory, T Th, 11-1. *Home Economics* 245. Special arrangements must be made by those wishing to register for three hours' credit, and who wish to take this course in place of work in a home management house. Fee for materials, \$2. Laboratory fee for third hour, \$10. Associate Professor DAY.

A study of home management problems as they are associated with problems of family life. The aim will be to bring about an appreciation of the need for integrating subject matter in home economics into a working philosophy of home management in its relationship to the life of the family.

EXTENSION EDUCATION

S 268. Organization and Administration of Cooperative Extension Projects in Home Economics. Credit two hours; or three hours to include laboratory. Daily except Sat., 12. *Home Economics* 100. Laboratory hours to be arranged. Professors VAN RENSSLAER and NYE, Extension Assistant Professor MORTON, Misses McDERMAND and DELANY, and Mrs. SMITH.

A study of the principles underlying the effective development of extension work in Home Economics; objectives of the extension program and its relation to other educational programs; local leadership and responsibility; study of Home Economics extension projects; relation of Home Economics extension to community life; records, reports, and other measures of progress; promotional methods; training, selection, and professional improvement of workers.

SUMMER COURSES IN HOTEL ADMINISTRATION

HOWARD BAGNALL MEEK, M. A., in Charge

[Professor of Hotel Management]

In 1922 Cornell University established, with the cooperation and financial assistance of the American Hotel Association, a four-year course in Hotel Administration for high-school graduates desiring to enter the administrative departments of the hotel business. Many hotel proprietors and managers, who have been unable to take a four-year university course, have asked for shorter courses with less formal entrance requirements.

To meet this demand the regular summer session of six weeks is divided into two parts, or half-sessions, each running for three weeks, July 6 to 24, and July 27 to August 14, respectively. The first session is devoted to elementary work, the second to the more advanced studies. The student is advised to take the preliminary and advanced work consecutively in one summer. Instruction is offered in food preparation, accounting, engineering, housekeeping, law as related to innkeeping, and personnel administration. For application blanks and information concerning the specific courses, applicants should write Professor H. B. Meek, Home Economics Building, Ithaca, New York.

REQUIREMENTS

Anyone employed in hotel work is eligible for admission. Prospective students will be required to present evidence of good character, of sincerity of purpose, and of interest in hotel work. It is distinctly to the advantage of prospective students to file applications early, in any event not later than June 15.

EXPENSES

The tuition fee for each unit course of three weeks is \$30.00. There is a fee of \$1.50 for Willard Straight Hall. Laboratory fees are required in certain courses for supplies used.

For further general information, see pages 13 to 21.

CORNELL UNIVERSITY OFFICIAL PUBLICATION

Entered as second-class matter, December 14, 1916, at the post office at Ithaca, New York, under the Act of August 24, 1912.

Published at Ithaca, New York, monthly July to September, and semi-monthly, October to June.

This series of pamphlets is designed to give prospective students and other persons information about Cornell University. No charge is made for the pamphlet unless a price is indicated after its name in the list below. Requests for pamphlets should be addressed to the Secretary of the University at Ithaca. *Money orders should be made payable to CORNELL UNIVERSITY.*

The prospective student should have a copy of the

General Information Number

and a copy of one or more of the following Announcements:

Announcement of the College of Arts and Sciences.

Announcement of the College of Engineering.

Announcement of the Law School.

Announcement of the College of Agriculture.

Announcement of the New York State College of Agriculture.

Announcement of the Winter Courses in the College of Agriculture.

Announcement of the New York State College of Home Economics.

Announcement of the Course in Hotel Administration.

Announcement of the New York State Veterinary College.

Announcement of the University Division of Education.

Announcement of the Department of Chemistry.

Announcement of the Graduate School

Announcement of the Summer Session.

Announcement of the Summer Session of the Law School.

Announcement of the Summer School of Biology.

Announcement of the Farm Study Courses.

Program of the Annual Farm and Home Week.

Annual Report of the President.

Special departmental announcements, a list of prizes, etc.

Other periodicals are these:

The Register, published annually in September, and containing, not announcements of courses, but a comprehensive record of the University's organization and work during the last year. Price, 50 cents.

Guide to the Campus. A book of 132 pages, including 55 illustrations and a map in three colors. Price, 50 cents.

Directory of the University. Price, 10 cents.

The *Announcement of the Medical College* may be obtained by addressing the Cornell University Medical College, Ithaca, New York.

Correspondence regarding the Cornell University Official Publication should be addressed to

THE SECRETARY, CORNELL UNIVERSITY,

ITHACA, NEW YORK.